Interview Transcriptions

Interview # 1

1AL file 11020701_01.mp3 dtd 7 FEB 2011

[Results from questionnaire indicate 64% of examiners were satisfied with the current FAA guidance and regulations for certifying new airmen in Advanced Display Technology aircraft. What changes, if any, do you perceive might be needed?] Just to educate the new applicants about the new equipment in the airplanes. And it could be good if they make a regulatory course out of it that's mandatory for every applicant. Because a lot of the applicants they do a self study, and in my opinion that's not enough. They have to go into a formal class to learn the equipment in depth. How it operates? How to troubleshoot malfunctions? How to get them out of situations, if they need to be. [Good.]

1AL file 11020701_02.mp3 dtd 7 FEB 2011

[Specifically with respect to pilot experience requirements, flight hours and so forth, what changes, if any, might be needed?] I think the hours are enough; it's the quality of training that has to be regulated. Instead of people just going through a mom and pop flight school to learn and do their self study, again it is good to go into a formal ground school and have a formal quality instruction. People now a days, they go to where it's the cheapest. And that's what's happening in the industry. It's really taking the quality of the instruction. [Good.]

1AL file 11020701_03.mp3 dtd 7 FEB 2011

[Results from the questionnaire indicate 81% of examiners perceive conventional navigation skills have been degraded. How should training and continued training address proficiency with conventional navigation skills?] Well you know, the, we go back to the regular stuff we've been navigating or learned through the old methods, some of these methods are obsolete now, like the non-directional beacon. Nobody in the whole country, maybe there's 15 or 20 serviceable. Typically now it's mostly GPS flying, it's shorter route, it's more efficient, and you save a lot of gas when you are flying from one place to another. So, the old methods are pretty much out the window. [Okay.]

1AL file 11020701_04.mp3 dtd 7 FEB 2011

[Advanced Display Technology has the ability to alert and aid pilots in potentially serious situations. At the private pilot level, what features or capabilities should be taught and tested?] Situation awareness is a big thing, and I think the FAA just implemented that now, and the single resource management. How to manage yourself in the cockpit? And I think in the latest version on the FAA in the implementation for the instrument and the instruments flight instructor, and it's will probably dribble down to the private pilot and other required certificates. [Thank you.]

1AL file 11020701_05.mp3 dtd 7 FEB 2011

[How might training and testing address automation surprise?] There is no surprise, I mean automation is automation. It's coming; it's being used for many years in large airplanes, now it's getting into smaller airplanes. So, you're going to have to keep up with the progress in aviation. [K]

1AL file 11020701_06.mp3 dtd 7 FEB 2011

[70% of examiners, from the survey, perceive that Advanced Display Technology has created risk taking behavior, like flying lower visibility or over reliance on the technology. How could training be modified to reduce this risk?] Just training individual the good technique of automation and use of the autopilot. And this way you know the autopilot usually flying the airplane much better than humans. All they have to be in managed properly. Again, it's system knowledge. [Just taking some notes.] That's fine.

1AL file 11020701_07.mp3 dtd 7 FEB 2011

[The questionnaire also indicated that more emphasis should be placed on higher order pilot skills, like CRM and so forth. Is there anything else that should be concentrated on?] Quality of training! That's the only thing the industry is in need for – quality of training. Because, nobody really pays attention to it. Everybody is worried about accumulating hours, but they could care less about the quality. And that's what leads into accidents. If you start controlling and regulating quality of training, you will notice that your accident, accident rate is probably decrease tremendously. [Ah, how could, would a quality program you, how would you structure a quality training program?] Regular ground school attendance. Make sure that every individual that's coming to learn how to fly, they do have to go to regulated ground school. DVDs, ground schools these days are very well equipped. And there done to a very certain level of understanding that a basic student can understand easily. We should keep introducing these new things about quality of ground school and quality of training to every individual. [Good.]

1AL file 11020701_08.mp3 dtd 7 FEB 2011

[Do you think it's important for students and pilots to understand how the systems works?] Absolutely! You know, the more knowledge in the system, system knowledge you have, the better understanding you will have, you can troubleshoot the fault much quicker. You know exactly what's happening, other than getting all worked up about it. 90% of the accidents, it's the human error. And most of these accidents, they are lack of understanding of the system in general aviation, I'm talking about. [Excellent.]

1AL file 11020701_09.mp3 dtd 7 FEB 2011

[Ah, do you require specific demonstration of certain features of the technology when you do a Practical Test?] Yes. The Practical Test Stand dictates that whatever in on the airplane, installed, it has to be utilized and the applicant should have adequate knowledge of it, i.e. the autopilot, use of the autopilot, the use of the GPS, so on and so forth. [Any other items you would add to that checklist?] Ah, well you've got to be fair to the student. You really can't ask him about anything that's not, not trained on. Or not, ah, you know, in his tasks.

1AL file 11020701_10.mp3 dtd 7 FEB 2011

[Ah, should applicants be required to demonstrate failure, system failures and troubleshooting procedures?] Actually this should be done in the simulator, not in the actual airplane. You know when you start playing with, the, certain things in the airplane, you're really looking for trouble. If you want to do that, that why they have a very nice invention it's called a simulator. You can do just about anything in there. I don't recommend anything be done in the airplane. If it's not, ah, not broken, don't try to break it in the airplane!

1AL file 11020701_11.mp3 dtd 7 FEB 2011

[Are there any other tasks, other than partial panel that are difficult to do with the technology?] Ah, no, not, not that anything that comes to mind.

1AL file 11020701_12.mp3 dtd 7 FEB 2011

[55% of examiners thought that the FAA should provide the examiners additional training with the technology. What specific training elements, if you believe so, should be given to improve the ability to certify pilots? This would be FAA training given to you.] Oh, the FAA does its share from educating pilot examiners, which there's supposed to be the elite of the pilot's group. And you know, these guys, these guys represent the administrator. Ah, it's just, I think they're going to have to teach themselves or go to proper schools to learn the equipment. I don't think the FAA is really responsible to teach them these things, in my opinion. It's just, ah, you know, if you want something, you got to work, go out, if you want to learn something. Go out and get it. This is a part of the business. You know, if you want to be good in testing these applicants that come to you in very sophisticate airplanes, you have to be ahead of the game. I don't think the FAA is really going, ah, do that for you. You have to do that for yourself. [Good.]

1AL file 11020701_13.mp3 dtd 7 FEB 2011

[Just to wrap up! Do you have any comments or suggestions concerning advanced technology and the certification process you might want to offer?] Well, you know, I think, ah, with this technology now everybody should be aware. The most thing that I really notice, that the people should be aware of the automation of the equipment they are operating. These new airplanes now, that, you know, you get free, Cessna, Piper, or Cirrus, they have the sophistication that far exceed the airlines, in certain cases. And ah, I think the, the applicants should be well capable of learning how to operate these systems before he comes into an exam. So he can demonstrate proficiency in these, these airplanes. [Thank you.] Absolutely!

Interview # 2

Recording of very poor sound quality – static!

1AU File 11020501_01.mp3 dtd 2/5/2011

[Results from the questionnaire indicate that 64% of examiners were satisfied with the current guidance and regulations. Ah, what changes, if any, do you may, perceive might be needed?] Oh, I don't think there's any changes required right now.

1AU File 11020501_02.mp3 dtd 2/5/2011

[Specifically with respect to pilot experience requirements, do you perceive there may be any needed, ah, changes? You know like flight times etc?] No. Do you want yes or no answers? Or do you want me to going on about these things.

1AU File 11020501_03.mp3 dtd 2/5/2011

[Results from the questionnaire indicate, that 81% of examiners perceive that conventional navigation skills have been degraded as a result of Advanced Display Technology. How could training and continued training to ensure proficiency with conventional navigation skills?] Have the instructor training basic navigations skills to proficiency. [Do you have anything else to offer or you think that?] No. More of this stuff is a, I mean like the flight times and, they can really put whatever minimum number they want. Nobody does that anyway. Ah the average for a private pilot experience is about 60 hours. Ah, it basically becomes a train to proficiency type industry. Ah, so the tasks are in there, the basic navigation tasks are in there. They're well covered. The instructors need to just spend more time with the very basics, like a pilotage, maps. Ah, we get into the little more technically advanced aircraft, then obviously the training goes up. Basic operation of whatever equipment they have in that particular airplane.

1AU File 11020501_04.mp3 dtd 2/5/2011

[Okay, Advanced Display Technology has the ability to alert pilots about potentially serious situations. At the private pilot level, what features and capabilities should be taught and tested in your opinion?] Ah, well at lot of this stuff on the advanced glass environment, Avidyne or whatever they are, those things squawk and basically divert the pilot's attention inside the aircraft when they should probably be looking outside the airplane. Ah, …. You can't get away with collision avoidance type systems, no matter how fancy they get, you still got to look out the windshield. The advanced stuff has the tendency to make all of the pilots look inside. [I'm just making some notes here.] aaaa, haaaa.

1AU File 11020501_05.mp3 dtd 2/5/2011

[How might training and testing address issue like automation surprise?] Ahhh, what we were just talking I would suggest a portion of it, for example, when those things start screaming, and beeping, and hollering at you, about traps. We need to be teaching these folks to glance at it a couple of seconds to

find out which one you're looking at (????). To look outside the airplane and not fly off the automation (????). You still have to look outside the window. [Good, thank you.]

1AU File 11020501_06.mp3 dtd 2/5/2011

[From the questionnaire, 70% of the DPEs perceive that Advanced Display Technology has created a risk taking behavior, like flying lower visibility, or over reliance on technology. How could training be modified to reduce this risk taking behavior?] Oh, I think just more training in ADM (Aeronautical Decision Making). Ah, honestly I don't see that as a problem right now. If you get the person out there that got the automation and is going to scud run. He's probably going to do that regardless of the automation. The automation (???) do it a little more than we would with good management of the basic weather requirements and still the basic weather requirement. Everyone has their own personal minimums. Just more education on exactly what proficiency level you are and what you can handle. [Good.]

1AU File 11020501_07.mp3 dtd 2/5/2011

[Results from the questionnaire indicate that 85% of examiners perceive that more emphasis should be placed on higher order pilot skills. What specific higher order pilot skills should be taught and tested at the private certificate level?] I'm not sure what you meant by higher order? [Like single cockpit, SRM, CRM.] Yeah we need to get back to some of the basics. I would think the verbage on that would be we still need to teach them to fly the basic airplane. Rule #1 is fly the aircraft! Maybe we need to get back to a little bit of that. Because the more automation and the more equipment you got, just increases the training time. But it's still train to proficiency environment. [Good.]

1AU File 11020501_08.mp3 dtd 2/5/2011

[Should training and testing require applicants to understand how the system works? If so, what level, depth of understand should a private pilot be required to know?] That's kind of a tough one, because we're required to test on every piece of equipment in the airplane. If this guy has a fancy FMS, Ring Laser Gyro system, he has to demonstrate proficiency to use that. That's pretty much up to our judgment what proficiency is. Ah, the basic private pilot, like to Garmin 430 for example, there's so many functions in there that you probably can't test the guy on every single function in there – there's thousands. But he needs to have the basics, he needs to be able to turn it on, and operate the unit in the environment he's going to be in. He'll change destinations, do his flight plan, make the box work for him. [Yeah, there was some research by another university, he was suggesting based upon where you're at maybe different levels of understand of the systems.] Yeah, as far as where you're at? I'm assuming you mean what certificate level? [Yes sir.] I get to the private level, yeah the understanding of the system going to be a little, requirement, my expectation is going to be a little bit less than a Commercial or ATP type level. At the ATP level you better, you better know all the ins and outs. You better know 99% of what that box will do. At the private, ah more of the basics. I'm not really interested in them setting up an instrument approach for a private pilot initial applicant. Ah I'd (??????) …. he didn't know how to do that. Just to be honest with you. (?????)….. and doing things he's not really supposed to be doing. [Excellent.]

1AU File 11020501_09.mp3 dtd 2/5/2011

[According to the questionnaire, 98% of DPEs require demonstration of certain features or tasks associated with Advanced Display Technology. What specific features or tasks do you think, require, or think should be demonstrated during a Practical Test?] Ah the basic operation of the unit whatever it happens to be. Ah, how to function when a unit quits functioning. Ah, like the old Garmin for example, how to put a flight plan in there, change destinations, a couple of little emergency things that it does - like what's, where's my nearest airport right now. Ah, change radio frequencies without having to fiddle around with it. Just pretty much the basics. [Thank you.]

1AU File 11020501_10.mp3 dtd 2/5/2011

[Should applicant be required to demonstrate system failure and troubleshooting procedures?] Yes absolutely. [Would that be based upon the same thing, you know, there level of] No, that one would be more of a basic function of the unit, I think. You got to know when the unit is working correctly regardless of whose box or what manufacturer it is. How do you know an air data computer has failed? And what are you going to do about it? Those kind of questions for any, any level of pilot. [Good.]

1AU File 11020501_11.mp3 dtd 2/5/2011

[72% of DPEs expressed difficulty performing certain Practical Test tasks and procedures, like partial panel, with Advanced Display Technology. What tasks or procedures are difficult to perform other than those?] No that's about it. The only one that's pops into my mind now is the partial panel. Because most of the fancy one's they don't really have, per se, partial panel like we used to call it. Even if they go back to a secondary backup instrument, those are full operating attitude indicators. [K]

1AU File 11020501_12.mp3 dtd 2/5/2011

[55% of examiners responding to the questionnaire think the FAA should provide Advanced Display Technology examiner training. What specific training elements, if any, could improve examiner's ability to certify pilots in the technology?] Ah, I don't really agree with that. I don't think there's enough training possible out there to make an examiner an expert on every piece of equipment. I think that come down to examiner's responsibility. I schedule a check ride, I will usually find out what kind of equipment it is, you know, a basic 172, or glass cockpit. And if it's glass or something I'm not real familiar with, I'll either get myself familiar – go out and take my own training. It comes down to my proficiency level. If I'm not proficiency and able to run that piece of equipment, then I won't take that test. [Very logically.] But there's just too many systems and styles, and then we'll get into training requirements that are just gigantic. [Fully understand that.]

1AU File 11020501_13.mp3 dtd 2/5/2011

[Do you have any, this is it, we're all the way through, do you have any closing comments or anything in general you want to mention?] No. I'm kind of anti-regulation on this stuff. It's comes right down to Aeronautical Decision Making type things. You cannot regulate common sense. You cannot possibility put enough regulations out there on the examiners to cover every single contingency that might arise.

That is why they choose us to do this sort of stuff. If I'm not comfortable doing this check ride, I just not going to do it. If I get in this piece of equipment, this guy come in with, and I'm getting over my head and I just don't understand it, we stop. That's really about it. If you're now comfortable doing this check ride and be able to test him in all the functions of this stuff, then you shouldn't be doing those rides. And we don't really need more regulation to tell us that.

Interview # 3

1DV file 11021002_01.mp3 dtd 2/11/2011

[The results from the questionnaire indicate that 64% of examiners were satisfied with the current FAA guidance and regulations for certifying new airmen in Advanced Display Technology equipped aircraft. What changes, if any do you perceive may still be needed?] The changes, I am a fan of having an endorsement. Not necessarily a new certificate, any sort of ride, just an endorsement for Technically Advanced Airplanes, as a posed to non-Technically Advanced Airplanes. My fear is people that learn in the Technically Advanced and proceed to the non- Technically Advanced, say they go buy their own airplane and don't buy with the G1000 in it, they are missing some building blocks that should be there. So I'm in favor of an endorsement for Technically Advanced Airplanes and non-Technically Advanced Airplanes. [Excellent]

1DV file 11021002_02.mp3 dtd 2/11/2011

[Specifically with, specifically with respect to pilot experience requirements what changes, if any, to you perceive may, may be needed as a result of advances in technology?] Well I don't think that, I think the current regulations does cover it. Because ah, as far as the Practical Test Standards says, operations to the systems. When a person comes to me in a TA airplane, he's obviously spent more time on those systems then a person who has done a 6 pack airplane. Because ah, just the complex(ity) of it makes it harder. But, if the instructor did their job, whether it was 6 pack airplane of TA airplane, ah, I guy's covered. As long as the DE asked questions, that are technical questions, and TA appropriate. At which time, of course I would give the TA endorsement. And then I would want the person to get the 6 pack endorsement once he learns in a 6 pack. And to tell you where it comes out the most, my fear the most, is not just the private pilot but the instrument private pilot. That's where this is deadly! I think the FAA is dropping the ball in not making a distinction between a person who gets a rating in a TA airplane with a moving map as a posed to a 6 pack airplane. They're not the same! But yet, technically, once I hand a guy an instrument rating he can legally get into any airplane and go. [With that endorsement, would he, if he got endorsed for one, would he have to come back to flight examiner or just get a flight instructor sign-off?] Just a flight instructor- any flight instructor who would do his job properly could, endorse, make the endorsement. [Excellent] I don't see putting extra cost or anything else into that. But I do see putting extra training. My debrief when I give an out an instrument rating, one of them today, is you're legal to go get in a 6 pack, DO NOT DO IT! Remember, legal and pro(ficient), legal, minimums and legal, ah excuse me, legal and safe, and minimums and proficiency – these terms are not interchangeable. A lot of people act like they are. Well I'm legal - But legal doesn't mean you're safe. I've got the minimums - That does not mean you're proficient. The same thing with this, if he has an instrument rating in a TA airplane, he going to need, in my opinion, 5 hours – maybe 10, to be the same proficiency in a 6 pack airplane. I think it would be worse going from TA to 6 pack, then it would be from 6 pack to TA. Because when he goes from 6 pack to TA, now what he has to really concentrate on is automation management.

Because, the rest of it's going to be a piece of cake to him. By gosh, because it shows me what I'm doing. [Got it!]

1DV file 11021002_03.mp3 dtd 2/11/2011

[Results from the questionnaire indicate 81% of examiners perceive conventional navigation skills have been degraded as a result of technology. How should training and continued training be changed to ensure proficiency with conventional navigation skills?] Well, ah, once again if, if, flight instructors and examiners do their job, I don't think we need to change anything. The problem is, is we're not doing our jobs. With the TA airplanes out there, it's so easy to turn on that moving map and say I'm not really using it. But they are, subconsciously they know it's there and they learn to rely on it. A matter of fact, I have failed more than one applicant that has gotten lost within 10 miles of their own home airport, when you turn off their moving map. Well it spells it out in the PTS that you will learn to do this by pilotage and dead reckoning. I'm with that 81% that believes that the skills have diminished. But part of that reason is, is that we are not being archaic enough, I guess, and demand on a flight test that a person prove that we can do that. And I think, in, in reality it's one of the longest parts of the test. It's because you have to go through at least 2 check points to see if a guy can: hit them, re-arrange them, re-do his time. Make sure he can make any changes to calculations, so he can get his next one right on. I personally tell I don't care, I'm going to ask them what time they're going to get first check point, I really don't care, that's based on forecast, by the time you get to your first check point you have real data. Do you know how to manipulate that data to get you to your second check point within Practical Test Standards? And I give them until their third one to make it happen. And if they can't do that, we come back and do that portion over again. But I do not believe all examiners are doing that. [Good]

1DV file 11021002_04.mp3 dtd 2/11/2011

[Advanced Display Technology has the ability to alert and aid pilots in potentially serious situations. At the private pilot level, what features and capabilities of the automation should be taught and tested?] Well, I'm a believer that all the abilities of the automation should be test. That goes back to systems, but you can't test everything or the test would take forever. But a good examiner is going to get a feel whether this person has learned their systems or not. I mean there's so many, I mean, my belief and what I teach when I'm teaching this, automation when used as a tool is a great thing. There's plant of stuff: it tell you when you're low on fuel, it tell you exactly how much fuel you're using, there's no way you can get lost looking at a moving map, it has weather features and stuff and it's almost like having onboard radar - almost. But they have to know the limitations. So these things are all great, when used as a tool, but the reverse side of that, is when used as a crutch. Then it becomes dangerous! Pilot skills start to erode: they rely on ??DPER?? to tell them they are at minimum altitude; they rely on fuel gauges to tell them how much fuel they have; they relying on the low fuel warning lights; they rely on the GPS – anything mechanical can fail. And if it fails at the wrong time under the wrong situation you're going to have an accident. So that's why I'm a believer, teach the people to use it and then teach them to use it as a tool to make their workload easier. Pilots are electricity – path of least resistance. They will head for what's easiest and, that's where the problem lies. How do we, how do we juggle between using it for good and using it to prop up the weak pilot. That's the question. [Excellent]

1DV file 11021002_05.mp3 dtd 2/11/2011

[How might training and testing address issues like automation surprise?] What do you mean like surprise? [Ah, suddenly the unit starts beeping and catches them off guard?] Right, yes. And examiner should, what I do when I give an instrument examine in a TA airplane, we have multiple failures for each approach. I personally go further, personally, I want them to be able to interpret needles. The only way I, they can prove that to me – is I take away their MFD – when they're shooting an ILS approach – they're shooting an ILS approach just like in a 6 pack airplane with the exception that their scan is different, obviously, because of the way the layout is. Ah, when they're shooting a VOR approach, just the needles. I give them the GPS and all the bells and whistles for the GPS (approach). They could also, depending upon the airplane, if they have failure, use the autopilot. Well I want them to be able to use their backup instruments. So, I'll fail this and the autopilot. So basically try to make a TA airplane as close as I can a 6 pack airplane. So they can learn and prove to me that they have situational awareness without having to have a moving map. Then when I have to give them a GPS, which is a requirement, then I give them everything and they have to prove to me they have automation management skills. It won't let the automation roll off and over task them and saturate. So I try to get them to prove both. But I don't believe all examiners do that. I get a reputation for being hard. Okay, I sleep at night. [Got it.]

1DV file 11021002_06.mp3 dtd 2/11/2011

[Results from the questionnaire indicate that 70% of examiners perceive that Advanced Display Technology has created an environment of risk taking behavior, i.e. flying lower visibility or over reliance on technology. How could training be modified to reduce this rick taking behavior?] That's exactly what I've been alluding to already. These are the people who are using it improperly and as a crutch. And I think it's going to get worse when we bring on synthetic vision. Think we have a problem now, let synthetic vision get down to a 172, which is coming. It's about to be here. Yes, I do think people, once again, a person who's going out scud running, using his terrain feature of his GPS to keep him out of trouble, once again, this is an Aeronautical Decision Making problem and it has to be approached from that in while we're doing training. Technology is never going to be the answer; it's the answer if we use it properly. It can also be the cause of the accident when people misuse it or use it as a crutch. Rely on it. And you just got to train that out of them. And that's just, that's something the flight instructor, that's part of the deal where a flight instructor when he signs an 8710 form, says I trained this applicant in everything. Which would include this kind of stuff. When I test him, I'm not allowed to test to see if he's going to use his terrain feature to scud run. But I see them for 3 hours, 4 hours, or 5 hours max and I got to make decisions on their aeronautical decision making skills. Sometimes it just points it out to you, but sometimes it can be hidden too. But if it's not trained, properly trained, there's no doubt the weak pilot will use this to prop him up and that is dangerous. And the risk taking pilot, who will take risks normally, will take more risks when he thinks, well I have a terrain feature that's going to tell me if I'm getting close to anything. Well, it ain't goin to work that way, we're going to lose a few before people. It's no different than with a Cirrus, a Cirrus with their, ah, parachute. That parachute isn't saving anybody. [okay]

1DV file 11021002_07.mp3 dtd 2/11/2011

[Results from the questionnaire indicate that 85% of examiners perceive that more emphasis should be placed on higher order pilot skills, like CRM and so forth. What specific higher order pilot skills should be taught and tested at the private level?] At the private level I'm looking for Aeronautical Decision Making. I'm looking for the single pilot resource management. Okay, it's made up of, what, 6 different tiers. And I think the highest tier is Aeronautical Decision Making. All right, how does, we get too much rote repeat at the private level and examiners let them get away with it. Scenario Based Training (SBT) by far is the best. And like I say, my, my, what I call, meet and greet or the pre-test briefing, I tell them at the private level it a license to learn. You're supposed to be able to take your mother flying 100% of the time and bring her back safely 100% of the time – not perfectly. You may answer a question with a safer answer then what the right answer is. And that's okay at this level. Because, we're looking for safety. Use your going Aeronautical Decision Making to keep from having to use your good skills. And I do believe we need to empathize this more. And then of course the next one is risk management, you know, we could stop all accident - nobody leave the ground. Hey they're all stopped we won't have no more accidents if no airplanes take off. Well we got to mitigate risks and we have to teach students how to mitigate risks. What's the risk? What's the reward? What is acceptable risk? What's not? I failed a guy today because he dragging it in on final. We're doing slow flight 50 feet off the ground and he doesn't see the problem with it. After I failed him and stuff and looked at him – what are you thinking? Oh, I got a little low. Low hell! I said, why didn't you go around? I didn't know I could do that. What do you mean you can do that? You can always go around! This particular student hadn't been taught enough – how to make decisions to do go, to when to do a go-around. And I think we're all at fault on that. We try to teach, we try to teach them to fix their faults. But we've gone a little too far. Now they're trying to fix them when they should abandon it and go-round and set it back up. And don't have those faults come in, in the first place. That risk management. It's easy to see the term, but it's not as black and white to teach. But if people would start thinking about it, then you're got automation management, you've got controlled flight into terrain, you've got situation awareness, and there's one more I'm leaving out. Those are the matrix they're talking about. The FAA comes out with their matrix; say we're supposed to test this matrix. It's another way of saying, how do you use good judgment? How do you teach them good judgment? I do believe you can, but I believe it's a taught thing. Too many people are trying to teach them to get a piece of paper – not all the intricacies of flying. When it shows up, when it does, it's my job to point it out. I hate that. That's my job. [Good, I like that.]

1DV file 11021002_08.mp3 dtd 2/11/2011

[Should training and testing require applicants to understand how the system works? And if so, to what level of understanding should a private pilot understand how it works?] When you say, how it works? What do you mean by that? [The logic behind the machine.] The logic behind the machine, not really. I'm not a nuts and bolts kind of guy. I want a student to understand and interpret the information. Not how the machine got the information so much, but, I mean, granted he has to know that if it's coming through an AHRS system or Air Data Computer, he's gota know where it's getting its information from.

But once it's there and there's a big red X, or certain things, I'm a firm believer in pulling out the G1000 Reference Guide. It tells you how to get it back, if you can or can't. You don't really need to know how to build the system; you just need to be able to get it back. And if you can't get it back, you need to know (noise). I'm not a nuts and bolts kind of guy. You don't have to, you don't have to trace oil through a power governor, it can be pure magic. You set it here, and it stays here. How does it do it? The governor makes it happen. That's good enough. Because as a pilot that's all we can do. But do you know how to change it, know how to increase it, know how to decrease it, you know what its limitations are, and you know it's ready to use. That's required. That's knowing how to operate the system. You don't have to go in and which Line Replaceable Unit is messed up when, when, this, this and this. You don't have to be a mechanic. I think there's a dividing line between mechanics and pilots. Pilots need to know how to interpret the information, bare minimums on how it gets it, only if they can do something about it. I can remember many years ago we had to know a Yaw Dampener, it moves the rudder 2.3 degrees either side, you can't read it, you can't do anything about it. It's either on or it's not. [That's good] I know that 3 and a half degrees.

1DV file 11021002_09.mp3 dtd 2/11/2011

[According to the questionnaire, 93% of examiners require demonstration of specific features or tasks associated with Advanced Display Technology. What feature or tasks to you require, or thinking should be demonstrated during a Practical Test?] Well basically when someone brings me a TA airplane, they are responsible to know all of the abilities of that TA airplane. And I can ask any of it. Ah, you know, I'd like you to take out that INSERT there, don't know how to d that. Wait a minute; you're not supposed to give me an airplane that you could not to that to. Right now we have MAP UP, what if you wanted to put NORTH UP? How would you do that? You should be able to do that. If he's going to present that airplane to me, he has to know how to use the stuff. This is what TA airplanes pilots a little, it's going to cost them a little more money, because it's going to take a little more time to figure it out. And they have to be taught that stuff. But as far as the Practical Test Standard says right now it's all in there, it's all fair game. A private pilot needs to be able to use the system that's in the airplane that's presented to me for flight test. Now granted I'm not going to head, like in layers of an onion, I go deeper the higher the certificate. Private – basic stuff. You need to do the basic stuff. And nothings a 100% test. But if they can't change the radio, if they can't tune the VOR, they can't use the GPS, they can't transfer the PFD to the MFD, I doubt if you would get through the test if you didn't know the basics. But that's, as an examiner, hey that's fair game to me. And all my applicants get that because they've been trained that way. Or the examiner, CFI won't send them to me, there's that that mean old (name removed) again, he's going to make me ask, to know how to use this stuff. Ah, G1000 will wash your socks for you; they don't need to know how to wash socks. It's not required. But they do have to know how to use the stuff they're going to use and need, and be safe with. And that's covered under today's regulations. I don't think we need anything additional other than DPEs being up on it themselves. And we all know that if the DPE doesn't know how to do it, he's sure as hell not going to ask an applicant to do it. [Good] Our FISDO required us to a TAA class and learn all that stuff prior to giving tests in TA aircraft. (noise) Technically I'm not supposed to give any aircraft, test in any aircraft that I'm not familiar with. So it's under the regulations. But my particular FISDO, my boss back then, that's quite a few bosses ago, when

this came, started into the market. Says, I want you to prove to me, I want you to go to an approved class and bring me the certificate that you learned this stuff. So that's want we did. We all did it. [That's good.] Yep, it's a good idea. I don't know if I want to make it a requirement. If a DPE is doing his job, it is a requirement. [Good.]

1DV file 11021002_10.mp3 dtd 2/11/2011

[Should applicants be required to demonstrate system failures and troubleshooting procedures? And if so, what should be demonstrated?] There's where I would say, what they should be able to do is recognize failures, and where they go to address the failure, which is usually the reference book, which is required to be in the aircraft, and I think that's all they need to know. Because once again, that's, what have I lost? Can I get it back? If I can great, if I can't what do I have left to take care of. But once again, that, that shows we have to have the basics skills, you know, the guy who relies on the GPS, and he loses the GPS for whatever reason, there's no reason to get lost. Because, he has a chart with him. Because somebody taught him, you always have a chart, you always plan for the GPS to die, and if it does, you just take up with what you already know to do. But that's assuming we forced them to learn it back in the beginning. Like any skill, if you don't use it, you lose it. So this is what a fight review could be looking to. To make sure these skills don't get to the level where they become dangerous and fatal. [Good]

1DV file 11021002_11.mp3 dtd 2/11/2011

[72% of examiners expressed difficulty performing certain tasks and procedures, i.e. partial panel, with Advanced Display Technology. What tasks or procedures other than partial panel do you believe are difficult to perform or demonstrate in the technology?] You mean other than partial panel? [yeah] I don't think any of them is hard to demonstrate. The partial panel is what creates a problem. And I think that's the only real problem. Because if you say you have everything else, I mean, I can lose PFDs, MFDs, I can do all this stuff by just simulating. You know, Sporty sell those little things you put over them. I'm a cheap ass airline pilot, hey I've got my note pad, 8 by 11 note pad, all I do is rip out a piece of paper, punch a couple of holes in it, put it over the button, and say you just lost this. And I do this, as opposed to dimming it, other examiners like to dim it, well I'm one of the few examiners willing to give an instrument rating in the clouds. And I will still fail their PFD in the clouds this way. Because if I need it, all I have to do is grab that piece of paper, rip it off, and it's right there. But it's required, what I do on a partial panel is, what we can't do at the airlines, is have a double failure. They lose their PFD which is a requirement of the Practical Test Standard, for an instrument rating say, but the reality is, if you lose your PFD all you do is hit the little reversionary button, and it moves your PFD over to the right (MFD) on a smaller screen. And you just fly it with an offset scan. I think that proves nothing. So in my brief, I tell them, they have a double failure. You lose your PFD and when you hit the button, the button doesn't work. So now all you've got is your standby instruments and your MFD to navigate with. And that's how they shoot a partial panel approach. And that proves they can do it. Now I also tell them that this is a test, this is a test, this is a bad day, this should be the worst it should get. Is the reality is, man move it over to the other screen and just fly it over there. Do not confuse a Scenario Based Test for reality, reality you use everything you got. Today I've got to fail different things, in different orders, you have situation (awareness). Like holding patterns, who cannot do a holding pattern when it's drawn out for

you and you can see it on the MFD. I fail it. And the way I fail it, and the way I fail it is I just put it in the test mode. So that we have the traffic stuff, which we would have anyhow, but now they have to interpret the needles. Oh, I've had people get lost in a holding pattern because they do not have situation awareness without looking at a moving map. I cannot give an instrument rating to a person that can't do that. Because when they go out and kill themselves I'd feel real bad. At least this way they have proved to me, they know how to get situation awareness without it being right there in front of them. The basics, I am a firm believer of the basics. Aviate, navigate, and communicate. Mode shed and never give up aviate. [Good stuff, thank you.]

1DV file 11021002_12.mp3 dtd 2/11/2011

[55% of examiners responding to the questionnaire think the FAA should provide Advanced Display examiner training. What specific training, if any, could improve examiners ability to certify pilots in the technology?] Well that goes back to what I've already address that, that issue, with which is my FISDO did. They, they made us go to an approved TAA course and show them the certificate prior to given a test in a TAA aircraft. Now, if you made me Czar would I make that happen? More then likely. I want the examiner to prove he has the ability, whether I do it through a, a course itself or when I'm doing their annual observation, the year they have to perform, I can test it and see if they have it or don't have it. And make sure they get up to speed, I mean, face it, you can't – I do type rating too also, you need to be current and qualified in the airplane to be able to give a type rating in the airplane. If you're not current and qualified you have no business. And really does matter if it's a large airplane or a small one, they're the same. So, yes the examiner must be proficient. How he gets proficient? They're different ways, but he must be proficient. [Okay.] Or he should excuse himself for giving an exam in that aircraft.

1DV file 11021002_13.mp3 dtd 2/11/2011

[Just to wrap up, do you have any further comments, recommendations, concerns, or anything else you care to offer?] I think I've said everyone I have. Well, I've been on my soap box for 40 minutes.

Interview # 4

1DF file 11021305_01.mp3 dtd 2/13/2011

[Results from the questionnaire indicate that 64% of examiners were satisfied with the current FAA guidance and regulations for certifying new airmen in Advanced Display Technology equipped aircraft. What changes, if any, do you perceive may still be needed?] Ammm, expansion of some of the tasks to limit, ah, some of the technology during certain segments, like cross country and some of the other navigation segments, so that when they transition back to round dials, or they do not have the GPS available, they have pilotage and dead reckoning skills, ah, to do their job. [Cool.] Kind of like we do partial panel on the instrument, for, in the event of. We know these guys will fly with round dials in most of the cases. So, it would be nice to know they can, ah, have the ability, the old fashion ability to look out the airplane and navigate. [Probe - One examiner was suggesting we have a technology endorsement at the flight instructor level, and the endorsement would be for both traditional and for technology. Would you be in favor of something like that?] Now you say it's at the flight instructor level, meaning the flight instructor would give the endorsement to any pilot similar to our complex right now? [Yes.] Yes, actually that would be very beneficial. So that if somebody just when through and did everything on round dials, they would receive on day of their private, ah, or sign-off prior to their private to fly conventional aircraft? Is that what you are referring to? [Yes, and the same thing would be with the, depending whatever you trained on you'd get that endorsement. If you wanted to go to the other technology or the older technology, you'd get a similar endorsement after proving that you competent.] Ah, that would make sense. Ah, the other consideration is that, ah, it gets too expensive if we get to far out there. But the technologies are so different between the Avidyne, the Garmin, if someone gets into the airplane without proper background it can be difficult for them. {thank you sir.]

1DF file 11021305_02.mp3 dtd 2/13/2011

[Specifically with respect to pilot experience requirements, flight times and so forth, number of cross countries, what changes do you perceive may be needed as a result of the technology?] Ammm, because of the changes, ah, better part of 10 years ago, decreasing the cross country time. If anything we would need less cross country because of the available information to them. Cross countries have become almost too easy on the average pilot that be flying advanced technology airplane. So the current levels should be, ah, should be suitable. [Thank you.]

1DF file 11021305_03.mp3 dtd 2/13/2011

[Results from the questionnaire indicate that 81% of examiners perceive conventional navigation skills have been degraded as a result of the technology. How should training and continued training be changes to ensure proficiency with conventional navigation skills?] Ammmm, it would be hard to mandate how it should be. At the instructor level we should have them, and encourage them to turn off the automation and the displays. So as to get people back out the window and back looking at ground references. [K]

1DF file 11021305_04.mp3 dtd 2/13/2011

[Advanced Display Technology has the ability to alert and aid pilots in potentially serious situations. At the private pilot level, what features and capabilities of the technology should be taught and tested?] Ah terrain and collision avoidance. They should know the limitations to it, when it will work, when it will work, when it won't. What the limitations to TAS versus TCAS might be?

1DF file 11021305_05.mp3 dtd 2/13/2011

[How might training and testing address issues like automation surprise?] Ah, what do you mean by automation surprise? Define that for me a little bit more. [Ah, suddenly the unit starts beeping and it catches them off guard.] Oh, okay. Yes I know what you mean now. Omm, even back to the original warning systems back on a 172RG, there's still people that think the stall warning is a gear warning or vice versa. And that's going to continue until instructors, instructors need to have the proficiency level to be able to teach the equipment and teach all about it. Ah, not just how it works in a normal flight. They need to talk about all the bells and whistles, if you will, that go with it. [So you believe it goes back to good instruction?] It does. I would definitely believe that, going back to your instructor endorsement earlier, at the instructor level there should be an instructor sign-off for every individual Advanced Technology Aircraft they can teach in. If there's only one sign-off for the private that's great, but when it gets to the instructor level, they should have multi, ah, they should be endorsed on each individual equipment before they can teach in it. [Good thank you.]

1DF file 11021305_06.mp3 dtd 2/13/2011

[The results from the questionnaire indicate that 70% of examiners perceive that Advanced Display Technology has created an environment of risk taking behavior, like flying lower visibility or over reliance on the technology. How could training be modified to reduce this risk taking behavior?] Mmmmmm, ommmm. I personally haven't seen the risk taking behavior go up on it. But it's been a small group of students that have been evaluated comparatively. Ah, mmmmm. [One of the examiner was suggesting more emphasis on risk management.] We are, and that's something coming up now in the new instruments and II TPSs they got the matrices for decision making. Which decision making is really risk management or threat and error management with a different name. Unfortunately, on the day of the check ride it is extremely difficult to evaluate what kind of risky behavior somebody's going to after the ride. The instructor generally has a lot more personality of what, his, the applicant's true personality is like. We see them at their ideal best, if you would. A guess getting a, possibly an Advisory Circular out to the instructors, here's the behavior you really want to watch for and correct. And as most of us have gone been humbled through our training, you might by the instructor saying - you might know it all, but this is a situation you can get into that's quite dangerous. [Good.]

1DF file 11021305_07.mp3 dtd 2/13/2011

[Results from the questionnaire indicate 85% of examiners perceive that more emphasis should be placed on teaching higher order pilot skills. What specific higher order pilot skills, and this would be like single pilot resource management, should be taught and tested at the private level?] It's already supposed to be tested, but often times it's not taught for one reason or another, and if the airplane has an autopilot, they need to be able to use the autopilot. Not just for wings level, and not just to maintain altitude when they're in cruise but through all aspects of the flight. With the advanced technology more airplanes are going to be equipped with it and they need to understand how that works. How pitch and power truly affected by the autopilot versus just knowing, hey I turn on and it holds my altitude. [Good.]

1DF file 11021305_08.mp3 dtd 2/13/2011

[Training and testing, ah, should training and testing require applicant to know how the system works? And if so, what depth of understanding should a private pilot be required to know?] They should at the very least know all the pages available on the Multi Function Display, ammm, what's available on the engine page, what's available on the NAV page, what's available on the waypoints, how to enter waypoints. True mastery of the equipment like we expect true mastery of the airplane by the time they are a private pilot. [Cool.]

1DF file 11021305_09.mp3 dtd 2/13/2011

[According to the questionnaire, 93% of examiners require demonstration of specific features or tasks associated with technology. What specific features or task do you require or you think should be demonstrated during a Practical Test?] Ammm, one of the short falls has been at the instrument level for students to not, don't understand the OBS mode being able to setup and intercept certain radials TO or FROM … (garbled), or bearings I should call them. Ah, they can go DIRECT TO but they couldn't build in, setup and use the OBS to intercept and create a …. (garbled) if they wanted to. Other than just flying to a FIX and flying to another FIX. [Okay.]

1DF file 11021305_10.mp3 dtd 2/13/2011

[Should applicants be required to demonstrate system failures and troubleshooting procedures? And if so, what should be demonstrated? These would be pertaining to the technology.] Hmmm, ah, they should have, they should know important instant access to the book (reference manual) is to help them troubleshoot it. We simply can't have enough knowledge of it ourselves without use of the book to help troubleshoot the loss of a system or part of a system.

1DF file 11021305_11.mp3 dtd 2/13/2011

[72% of examiners expressed difficulty performing certain Practical Test and procedures, i.e. partial panel, with advanced technology. Specifically what tasks or procedures are difficult to perform in Advanced Display equipped aircraft?] Unusual attitude: trying to limit their view of different areas of it, especially with Garmin that won't allow us to pull circuit breakers on the Cessna period. It makes it very

difficult, ommm to get rid of the thing, so we can force them to do true unusual attitudes off of, ah off of the backup instruments. [Got it.]

1DF file 11021305_12.mp3 dtd 2/13/2011

[55% of examiners responding to the questionnaire think the FAA should provide Advanced Display examiner training. What specific training elements, if any, could improve examiner's ability to certify pilots in the technology?] Mmmmmm, we as examiners should be required to have 5 hours of PIC in a certain Advanced Technology Airplane before we can give a check ride in it. Very similar to what you have to have for multi-engine or helicopters in the make in model. A lot of examiners, have been, their first exposure to a new glass would be with a student that they're learning while they're testing it. [Omm, I've had some examiners say that if they don't feel confident and proficient in a particular equipment, they won't do it.] That's true. And I've had my exposure to the new airplanes, when I got exposed to: the Avidyne, the G1000, I arranged to rent the airplane with their instructor prior to them, prior to my giving them the test. So I could become comfortable with the equipment before I tested it on them.

1DF file 11021305_13.mp3 dtd 2/13/2011

[Omm, just to wrap up, do you have any further comment, recommendations, concerns regarding this research you might offer that I haven't brought up?] Ommm, no. The biggest difference I'm seeing now on how they are accepting the technology is bias by people's age groups. Ah, the younger kids that have grown up programming computers all day long are very adept at picking up the glass airplane. The people having the most difficulty are the guys that have been flying 10 years on round dials and trying to step up to this without a lot of computer background. That's probably for a whole separate paper. {Okay, I'm going to stop the recorder.]

Interview # 5

ICR file 1120203_01.mp3 dtd 2Feb 2011

[The results from the questionnaire indicate that 64% were satisfied with the current guidance and regulations for certifying new airmen in Advanced Technology Aircraft. What changes, if any, do you perceive may be needed?] Okay. What changes I perceive the FAA deals with DPEs? Is that the question? [With the guidance, or the practical standards, or is there anything in the guidance and regulations that might need some attention at all?] Well the biggest thing that I would address in that particular area would be there is some ambiguity in the PTSs themselves as to how much leeway a DPE has in judging whether a person passes or not. Ahh, the PTS says in one case that you meet the standard. Yes, that what we want everyone to do is meet the standard. They also say things like, at the discretion of the examiner. And ahh, when you're going to test a guy, and he cannot repeat a maneuver, but then they said if the examiner feels the maneuver is not complete, he can have them do it over. It's a, there's a lot of ambiguity in the direction given to the DPEs by the FAA in the PTSs. That's something I'd like see addressed. [Is there anything specifically dealing with the technology itself?] When you say technology it's a wide term. What do you mean? [Ahh, I'm talking like the G1000, all the bid FMSs in the small aircraft now.] Well, not, not in concert to what I just said. No. Ah, the different panels that you have G1000 and other smaller GPSs that are not actually IFR approved that's pretty easy to teach. You do have to use different methods to show people how to deal with partial panel situations because if the G1000 if the lights go out on both sides and you have 3 instruments left, that's it. And I don't know that I can suggest anything to make that any better at this point. [Okay, that's good.]

ICR file 1120203_02.mp3 dtd 2Feb 2011

[Specifically, with respect to pilot experience requirements, what changes, if any, do you perceive may be needed as a result of advances in technology?] Pilot clearances? [Pilot experiences, flight hours, time etc.] Pilot experiences..well. What I think we need to do in the area dealing with glass panels, that's what're getting at here, at least at this point, okay, the best thing to do in dealing with people getting into glass panels, is to realize there're not playing a video game. That's the very first thing. And I get a lot of young applicants, you know, that it's almost a like video game - they forget there's a windshield out there to look outside of. And that's become a real issue and I sort of got on to a few people about that. Because they get so involved in the glass panel they forget what there even doing. For instance, if you have a guy with a glass panel and he's not real familiar with it, he hasn't been taught thoroughly, how to set the CDI for instance, and you tell him to go to a particular VOR, and the VOR is being display over on the MFD, he won't even notice that. He won't be looking outside for any landmarks or anything else. Hell just be looking at that one panel, on the PFD, on the left side. And that's been a real issue with me. And I go back to their instructors, and I said you really need to bear down on this area here. That's been a big problem with teaching to these full glass panels, is people getting oriented on one area that forgetting about the other areas that are still out there that they need to be resolved.[Excellent, excellent, good feedback.]

ICR file 1120203_03.mp3 dtd 2Feb 2011

[Results from the questionnaire indicate that 81% of the DPEs perceive conventional navigation skills have been degraded as a result of Advance Display Technology. How could training and continued training be changed to ensure proficiency with conventional navigation skills?] Okay, well we're going from glass panel to six pack and I agree with them. In certain case, I've seen that their basic piloting skills, using pilotage and using dead reckoning, has been eroded to the fact that when they are training only in the G1000, for instance, it's almost nil, almost zero. The other thing in that case, they can take the FAA written test or whatever they are going for, let's just say a private pilot, and the FAA written test will deal in some of those things, but the problem with an FAA written test that it's nothing but a memorization test. You study the questions the FAA is going to ask you, and you study the answers that go along with those questions, and it's a memory thing. Now, if a guy makes a 98 or even 100 on his test, I can take him up and say I want to do dead reckoning from point A to B. And they'll just look at me like I took away their lunch. What are you talking about? So, I really got on to the instructors I work with. I said, you really need to teach this in addition to the G1000. Of course their feedback there was they have a moving map and everything. If the lights go out, what are you going to do? So, that's been my point on that. [Excellent.]

ICR file 1120203_04.mp3 dtd 2Feb 2011

[Advanced Display Technology, like the G1000, has the ability to alert and aid pilots. What features and capabilities, of these new capabilities in the cockpit, need to be taught and tested?] Well I know what you're getting at, when we get red Xs, alerts, warnings, red warnings, and caution warning whatever on the G1000, ah, the first thing I think in teaching this, the instructors need to sit down go over thoroughly with each particular area – the cautions, the warnings, the alerts, whatever it happens to be, so that the student in this case can be able to thoroughly analyze what he's looking at and what it means. Ah, my flying experience corporate aviation and military, when you get an enunciator light you need to be able to instantly recognize: number one how much of a priority is that to deal with right now? Ah, for instance, if you get a caution light on approach, do I need to deal with this right now or not? I've seen some students, applicants my case, who really did not understand what that meant. And they say, right now I'm on the approach and I want to get away from it. So I say okay, that what you need to do, but you need to understand what its telling you. Can you get away with it, and do away with it, and not resolve it before the landing? In this case, make a go around. So, there's been a lot of dialog in teach that because number one you have a private pilot coming in that really doesn't know aircraft systems and things like that. And instructors really need to teach that to them. Most of them have been doing a really good job, Mike, but there's been maybe 15% that need a little bit more tutoring.[That's good, that's good to have an actual number to go with.]

ICR file 1120203_05.mp3 dtd 2Feb 2011

[How might training and testing address issues like automation surprise?] mmm,, automation surprise? [You know something pops up and they're obvious to what's going on.] Okay, now this just happen to me not long ago on an instrument check ride. Guy had a beautiful airplane, had it on autopilot, had it on

altitude hold, and all that good stuff, and whether he kick it off accidentally with that autopilot disconnect switch or something actually happened to the autopilot is immaterial to our discussion here then, but without any warning or enunciation the autopilot came off altitude hold and the airplane started descending. It was on approach and I let it go on until it was going to be a failure. And I pointed to the altimeter and said what about that? Of course he grabbed the airplane right away! So to answer your question, the teaching there when they're dealing with different piece of equipment like that is to make sure if that equipment is being operated to turn that on as part of their scan. And then be able to determine when something is not right or if everything is going okay. [Yep, that sounds like a lot of what we've been hearing about.]

ICR file 1120203_06.mp3 dtd 2Feb 2011

[Next question, results from the DPE questionnaire indicates that 70% of the DPEs perceive that Advanced Display Technology has created an environment of risk taking behavior. That is flying in lower visibility or over reliance on technology, how could training be modified to reduce this risk taking behavior?] Well that's a good question, because we see it a lot. Guys get into a G1000 airplane, they're not instrument rated, all of a sudden they have all this stuff in out in front of them –showing right on the panel that where they're at and everything and they get in trouble. And I'm not sure how to address that. I really don't know. The instructors just need to be able to sit down and teach them. So follow your panel, follow your map, if you can look out and see what's going on. Make sure you have a thorough weather briefing. And make sure you understand that weather briefing. Because that's where people get in trouble with this G1000, they get out there and they really didn't listen to the briefer that good and all of a sudden they get into diminishing visibility then find themselves in trouble. [Good]

ICR file 1120203_07.mp3 dtd 2Feb 2011

[Aaamm, results from the questionnaire indicate that 85% of the DPEs perceive that more emphasis should be placed on higher order pilot skills. What specific higher order pilot skills should be taught and tested at the private pilot level?] Well, that particular statement as I'm reading it is pretty ambiguous. Ah, higher pilot skills, there again we're going back to each individual examiner deciding what the pilot skill level that he's trying to get to prove that he has. But if I test a private pilot and he can hold his altitude, say in a speed turn, within a 100 feet like the PTS calls for, ah then I call that meeting minimum standards. I do not accept that as being a good pilot however. Because, if you can't hold it within a 100 feet, really you don't need to be flying anyhow. That's just my particular thing. It's sort of an ambiguous thing. Ah, the thing that I suggest to instructors I work with, well I say if the PTS in this case 100 feet in altitude, then cut that in half. If it gets up to 50 feet start barking at them. Because that will start making them more a where before they ever get to 100 feet. They need to increase their efficiency. All this comes from instrument scan, and then interpretation, and understanding. [Thank you.]

ICR file 1120203_08.mp3 dtd 2Feb 2011

[Should training and testing applicants how the system works? If so, what depth of understand should a private pilot be required to know?] Say it again please? [This has to do with the technology, should training and testing require applicants to understand how the system works? If so, what level of

understanding should a private pilot be required to know?] Okay yes, training and testing of how any system works. I don't care if you're talking about a trim tab or talking about the G1000, is mandatory on how the system works. Ahhh, is… well to me not a good statement. It's what you can expect out of a system more than how it works. What can you expect out of a system, if you do certain actions. Ah, let's go to an autopilot, if you put an "autopilot on" and punch "altitude hold" on it, you expect the thing to hold it. On altitude if it doesn't, you have an issue and you start dealing with something else. Ah systems, how do you pre-flight the flap systems on the ground? Do you just reach over to the flap panel on the 172, for instance, flip it to full down, or do you check it at each level, 15, 20 degrees, may sure it stops where it should and comes back up the same way. To me, that's the way a system should be taught, and do it. So when you do something, the person doing it should realize what he's looking for. Not necessarily how a system works. And you want certain reactions. [That's good. We're moving right along, making good time.]

ICR file 1120203_09.mp3 dtd 2Feb 2011

[When it comes to flight demonstration, doing the Practical Test, according to the questionnaire 93% of examiners require demonstrating specific features or task associated with Advanced Display Technology What features or task do you require or think should be demonstrated during a Practical Test?] Well that's a simple question to answer. If the airplane is equipped with a certain piece of equipment the applicant has to be able to demonstrate that he understands how to use it and what it will do for him, period. [I'm just taking some notes.] Okay.

ICR file 1120203_10.mp3 dtd 2Feb 2011

[72% of examiners expressed difficulty performing certain Practical Test task or procedures, for example partial panel, what task or procedures are difficult to perform and demonstrate in your opinion?] I got the first part of that Mike, One of us is cutting out. And I did not get the last part of your question. [Ah, talking about performing Practical Tests, there's been a lot of discussion about difficulty doing partial panels. Is there anything else other than partial panels that you've had problems trying to, ah parts to do?] Well partial panel, the reason we teach partial panel to start with is obvious when we have failure of given instrument. There again it goes back to my statement, you do not need to know how a system works , you need to know what a system is telling you. Now when you lose a given instrument, just like we say you lose your attitude indicator, okay if before that ever happens the instructor has not taught the student when he makes a turn to look at the attitude indicator, and let's say it's turn to the left, and you glance at the turn coordinator to make sure it's also turning to the left, you have 2 things you're coordinating. This comes in the instrument scan. If people don't teach instrument scan then there's no sense teaching partial panel. Because, the student can't accomplish anything. He doesn't know what he's looking for. Just, ooo I got something broke and I don't know what to do. Ah, so I do partial panel and I do unusual attitude recoveries. And in doing unusual attitude recoveries, I say, okay the reason people get killed because of unusual attitude recoveries is they get special disorientation or vertigo as it's known. So when we do this maneuver I'm going to have you put your head forward at 45 degree

eyes shut. You're flying the aircraft, I won't touch the controls. Give me a left full power climbing turn. I'll let the guy get started over like that. I'll let him get twisted up, and everything like that, so he experiences real vertigo. Then I'll say, look up and recover the aircraft. I'll do that even with a private pilot. I do it visual and also with a hood on him. Now let's do it with a hood. And I'd say, the biggest time you'll get in a real situation like this if you've on a night cross country and you run into an unexpected fog bank or clouds, or whatever and you need to be able to make a 180 degree turn standard rate, and not lose any altitude, and get out of that mess. In doing so, you could have something fail and if you're not use to making a scan of all the instruments and interpreting what they're telling you, you're not going to be successful. So that's my answer to your question to the best that I can do it. [Thank you.]

ICR file 1120203_11.mp3 dtd 2Feb 2011

[We're getting close to wrapping up.] hmmm [55% of examiners responding to the questionnaire think the FAA should provide more Advanced Display Technology examiner training. What specific training elements could improve the examiner's ability to certify pilots?] Ooooo that's sort of a tuffy. [I had a lady, she did not like biannual clinics.] Biannual clinics? What's does that mean? [Every 2 years go to the FISDO and they present some kind of a refresher clinic.] You mean for the CFIs, instructors? [No for the examiners.] Now we do our's every year that's why I did not know what you meant. [Okay maybe it's every year then.] Now ever year I go to my POI, at FISDO you know, we take a check ride and I discuss with him problems that come up in the past 12 months. Turn in my report on how many have past, how many have failed, and that's basically what we do. I don't know what this person, this lady you're talking about didn't like. Because as I go through the year, before I do any one check ride, I do about 7 different check rides, I review each check ride before I ever get on. I review the reason for doing it in the PTS. Do everything I can do about the ride to keep myself up to date and totally informed on my own. I don't have to wait one year to do it. I'm not sure what she meant. [Okay.]

ICR file 1120203_12.mp3 dtd 2Feb 2011

[Do you have any other comment, recommendations, or concerns?] You pretty well stated my case there. You got it down there. Ah, thing going along pretty good. I have an exceptional good POI. He's easy to work with. The FISDO doesn't they mess with us too much. Because, the DPEs are under his hat. And, ah, when I do have a problem, I'm able to go to him, and discuss it with him, and how about resolving this. The one big thing that we've had more issues with then anything else, I'm not sure if you're familiar with, is IACRA. Are you familiar with it? [Yes.] IACRA has been about 85% effective, but every now and again we get a good one. And they went, they took IACRA out of the government and put it in a civilian deal. And ah, they've had some problems, like I'll called IACRA directly and I'll say have this problem here, and they'll tell me okay I'm going to give you this ticket number and someone will call you back. I'll be the first to admit I get a call back rather quickly – within 2 or 3 hours anyway. But the, it just seems like that they need somebody right there ready to answer your question if you can answer the phone at all. That my only comment there, so that's the only improvement I can tell you. [Okay, thank you.]

Interview # 6

ICM File 11012807_01.MP3 dtd 1/28/2011

[The first question we had to do with from the questionnaire indicated that 64% of examiners were satisfied with the guidance and regulations, so 64% believe are pretty much in agreement that its adequate. Is there anything you perceive that is lacking?]

Well I think back to what I originally stuck with I think it's adequate too. The problem has been it is adequate for what it addresses. But the problem has been for the last four years..five years is that the technology is way ahead of the guidance. New technology is way ahead of everything. [Okay..what specific elements are not addressed or not even called out in] As far as the practical test standards? [Okay I have an area with the PT ...why don't we answer it there then] Okay that's were I see there… okay let me tell you in my words and you can put it however you to .. how's what?[Let me get to the practical test…okay]The PT standard does a nice job addressing specific tasks and objectives..really it is very good. Particularly the instrument portion we have more advanced aircraft with avionics now were the autopilot from 500 feet on the autopilot can fly the entire flight do all the approaches do everything until you're ready to come back and land again. So there's nothing that addresses how much. It addresses how little you can do of specifically an approach. They're starting to nibble on that a little bit…they're starting to work through it but it's really hard..in one case they do an instrument check ride in an airplane that was manufacturer in 1968 an then the next day you do a flight check in an airplane that was manufactured in 2010 and has the latest avionics. [okay] and particularly when you get to partial panel work an inoperable instruments...with instruments work..ahh…they have to do what's considered partial panel approach well with the new airplanes that's sort of a moog point as there is a primary flight display, multi function flight display, and should the left side go out you push a button on the G1000 and what's on the right side transfers to the left and it's over. Or you can dim the thing down and not have anything which again is not realistic but if part of it failed it's setup that…you now going to have…it would be very rare to have a complete failure on both sides at the same time. And I think the PTS are going to come more in addressing the new technology. That's a hard thing because there's so much of the new technology. It's come so fast and there's so many different things that I can see why it takes a while. [okay…cool] But we have to have a way…something standard because we don't go around covering up things on the flight displays, like a traditional instrument where you could cover up traditional instrument to create emergency situations and these you don't shut them off. You don't pull circuit breakers and put stickies on them. Do just dim it. And it's very hard…it's very hard to follow the PTS exactly and do justice to the new technology.[okay..got it] That make sense to you?[yeap..absolutely] The PTS work beautifully with the older technology. And another thing for another thing you have tablets now, everyone and their brother has iPod…you got the iPad they can get all their charts on it. It has a portable GPS which they can't use for the instrument portion. But it has all the approach charts which certainly they can use. But it's there and that's perfectly acceptable to use that. Omm, there's just a lot new stuff out there. I don't know how anybody keeps up with it. [I can understand that…omm] Again, that's not negative that's not sick. We went along for 30 years with sort of what I call normal changing….in normal…a little bit new every year… every other year, but all of a sudden..boom. We had the new Avidyne system. We had the G1000. We have a light sport airplane

that's coming out which cannot be used for instrument training. But we have light sport airplanes coming out with more sophisticate avionics….ommm….and they all have these little autopilots. You can just sit there with your arms crossed and fly to whole thing almost.[yeah, i agree with had. The systems can pretty much fly themselves as long as everything's working fine.] If they're monitoring the system. Yeah and there's a good description now of what has to be done with or without the autopilot. But it's still a fine line about how much is too much. Or..because..trying to do…trying to follow the PTS is what we all do and it's hard to know how much is too much or how much is too little. Like weather, ah you know they're tested on weather in the PTSs. But now people pull up more sophisticated stuff on their cell phones now. Yes and watch the weather moving. [Yeah, I agree]

ICM File 11012807_02.MP3 dtd 1/28/2011

[There was some variation when I was asking about experience requirements, do you the number of hours are enough with all this technology? Is there enough experience there with all the information they have to gather and process?] Well what I honestly believe is I think yes, because that is the minimum time. An Instructor is supposed to train to proficiency, so they have a minimum time. But if a person needs more time there's nothing to say they can't take all the time they need to finish..do the job. So that's just minimum times, those are just minimum times. And somebody going through a very structured, like Oklahoma that has a very structured 141 program, where it's intense, it's focused and they actually are getting through it in minimum time. But they are doing a very good job at it. [That makes sense depending upon the structure of the program.] But there's nothing that limits them to more time. [Okay]

ICM File 11012807_03.MP3 dtd 1/28/2011

[Ommm, going on to the safety arena, omm, 81% on the survey indicated they perceived conventional navigation skills have been degraded with the technology.] I agree.[And I saw you were pretty consistent with them on that.] mmm.mmmm I agree and I'm beginning to agree more and more, because when they are dealing with the new technology when they are having to monitor the new systems…ahh…just the plan old looking out the airplane is sort of going by the wayside. I think this is why we are having more and more problems with close calls with other airplanes. And, and we just had a mid air in (location removed) with two fatalities and it was good VFR and it was an EMS helicopter operation and an airplane. And it, from all intensive, it looks like, maybe…I have not read the latest NTSB thing maybe the helicopter came down on top of, clipped the airplane. They were both in the traffic pattern at (identifier removed). It was a beautiful day. [How do you think training or continued training might address proficiency issues or what things do you think from a conventional navigation skills need to be demonstrated?] I think one thing would be helpful if we get more technology trainers that we can use in the classroom. Where, for example the G1000 trainers, we don't need the full airplane for the GPS. We need a workbench with the GPS. I think it's going to be helpful, as more schools can afford the technology to do more training in the classroom, so when they actually put the stuff in use in the airplane there not so focused on which button to push. They can actually look out and beware of what's going on. Not just go with their, because most don't have TCAS. And they have these little portable TCAS things they get, but there not fool proof. But so much of the training is still in the airplane itself that with

all the new technology it's just so busy. It's so busy for a student. And the schools that where have the, like the FASCOs with the G1000, they have the mockup of the GPS, the mockup of the things and the trainers they can use, the ground trainers. Actually when they get into the airplane they already know what they want to do. They are just putting it to use. They may fumble around a little bit, but they are not just learning it in the airplane. [Okay, do you think there needs to be any recurring training maybe with steam gauges or proficiency in that arena, or VOR navigation?] Well, I don't know. Because, you can't, it does seem to be very useful to make people retrain in something they are not using. [okay, okay, so] If they are using it they have to retrain. But if it's something they are not using it just seems to be a waste of money. Why go out, why would you go out and train in something you're not even using to start with. [That makes sense.] Kind of like LORAN, you remember LORAN first came out, you're probably too young, but when LORAN first came out many many years ago. Okay, now if you had an airplane with LORAN, would you retrain it? No, it's not even used. It's just taking up a box in the airplane if it's still there. [It's like RNAV and all that stuff that's gone away.] mmmm.mmmmm

ICM File 11012807_04.MP3 dtd 1/28/2011

[In the area of advance technology displays systems have the ability do a lot of alert and functions and be able to aid us in potential serious situations, at the private pilot level, what parts of those features or capabilities do you think should be taught and tested, if any?] Well, there's a check airmen for one of the airlines that's very involved with GA that works at one of our local airports he uses everything. I watched how he does it. But what he does is, he doesn't use everything at the exclusion of practical airmanship. For example, his students, I do check rides for him, his student, you shut everything off in the airplane they can divert to anything, they can figure out anything. They do good pilotage. They don't get lost. He does everything from the ground up and I've seen how he does it. Because he teaches people to know where they are and keep up where they are. And they use all this stuff as backup. And they really know what they're doing, they really do. They don't ever…they are now just depending on one thing to get them there. It's not the students, it's the instructor. Some of the instructors can't get themselves anywhere from A to B. [mmmm] Some of the instructors I can take them 10 miles away from their home airport and they can't find it again without the GPS. They literally couldn't divert or do anything, so I've change my mind about this a little bit. I've decided it's not the technology, it's the instructor and how he applies the technology.[That's good. I'm just taking some little notes just in case I have a problem with the] Well if I'm not coherent about it, tell me.[no.] I used to think the technology was causing the problem and I've changed. I think it's having instructors that don't know how to use everything available and they are just so zeroed in on part of the technology for themselves. People teach what they know and teach what they're comfortable with. Because I've watched this gentleman, now he was an airline check airman, but he also does, instructs, in very high performance airplanes, he also teaches in little teeny tail dragger airplanes with nothing, he just teaches people to know, what they're, they use everything in the airplane - be competent – but he also teaches them that as things break in the airplane, they just going on, they don't miss a beat. A lot of his private pilots are better than some of the flight instructor candidates I see. [mmm] And he teaches, again teaches them in minimum time. Because he's a serious instructor. [That's, that's very interesting.] Yeah, I had to change my tune a little bit because I kept saying Mr. (name removed) how can you teach, okay, you started with

traditional instruments here and now you have them using this. He said, “you just teach them”. You teach them to integrate it, you teach them what they should be doing. They have to know more, they’re not just flying the instrument, or the instruments flying them. They’re supposed to have a complete working knowledge of what they are doing. And I’ve listen to him, and he’s very demanding. [mmm] He’s very focused and he’s hard. And his students are totally capable. And they have been in ages from 16 to 65 that I’ve done flight checks for. And they’re the best I’ve seen. And he actually gets them through in minimum time – every single time. I don’t know how he does it. [mmm] So I’ve decides it’s not the technology that’s getting us, it’s depends on the instructor and the quality of the instructor that gets us.[Do you have a point of contact for that instructor? Do you think he would mind if I called him some day?] Yeah, his name is Mr (name removed), and he manages to integrate this whole thing. Ah, at first I thought, he just..ahhh [I’ll drop you an email and you can just send me some contact information about..] Let me give it to you right now. [okay] Here’s his phone number [okay] Just give him my name. Here’s his number, area code (phone number removed). [okay] Because, what got me was he’s dealing with the same airplanes, same old airplanes, the same new airplanes, the same everything. And I have another instructor using those same airplanes and the students honestly, it’s kind of like in (location removed) where you have (location removed), and you’ve got (location removed), and (location removed), you have all those airport right around there. And you know when you divert from one to another, it’s not like you’re crossing state lines. Ah, we’ve got airports within 10 mile of each other and they actually couldn’t do anything. And his students, we could go out in hard winds, we would go out in harsh conditions and there were some gentleman that were about my age, in their 60’s, and I thought mmm and they are just starting, getting their private certificate. And I thought maybe they don’t want to be doing this today. And they evaluate it, work their crosswind components, and they would make a decision and base it on what’s realistic. And they handled it just beautifully. [Well, I think that’s very interesting and that’s the kind of comments...ahh..I’m trying to dig…I don’t have, I don’t have any thought one way or the other. I’m just a private pilot and..] Yeah, I decided that it’s the instructor that makes the difference, not just the technology, not just the student, not just...ah, and I asked one of the gentleman who was doing his check ride with me and he said “I’ve always wanted to do it, I finally got my kids grown and I wanted to do something for myself”. I said, how did you, how did you learn to do this is this amount of time? Well, Jim just expected me too, you know. [Set high expectations.] Yeah he had high.., and he got it. He got results. So I decided, and just don’t say just a private pilot that’s a lot the private pilot is the hardest rating there is. It’s the foundation of the whole deal. Because if you look at all the PTS, Airspace is airspace (researcher) no matter what it is. Weather’s weather. Whether it’s the ATP or private. It’s all the same weather. So a lot of those same tasks are the same thing. It’s just repetition with a little bit added on. So don’t just say a private pilot.[okay, what I was just trying to get at was that as your rating go up, you know, there’s more and more, you know, expected.] Yeah, but the private is the bases for the whole thing. [I agree] It is, you did the hard one.

ICM File 11012807_05.MP3 dtd 1/28/2011

[Just to switch gears back in flight demonstration a little bit, ahh, are there specific features or tasks associated with the technology that you require during a PT?] Yessss, but we’re going more toward Scenario Based Training, kkk, so we try to build in scenarios that gives them the opportunity not just to

answer, like - how much fuel do you have?, but we try to give them scenarios where they can make choices, and solve problems, and show good judgment, and demonstrate they can handle situations. More than just call it the rote answer. [Okay, ommm are you requiring then to demonstrate certain capabilities of the system that would not be available on a steam gage aircraft? Because there's a lot of Flight Management and capabilities built into those things.] Well just about, we don't touch circuit breakers and we can't actual fail anything. What we can is dim down the thing. There's some things were not supposed to do. And it's harder with an Avidyne system because if you have to shut something off, you can't dim it down the same way. Actually the system will not come back up until you land and shut everything down and start it back up again. Omm, so we have to simulate, simulate, these failures and these situations and that's a little harder with Avidyne then with the Garmin.[What was with the Avidyne – you can't dim it? Or what the issue with the Avidyne now?]Ahh, with the Garmin you can just turn the knob and dim the thing down and create a failure with no problem. With the Avidyne system, it doesn't work the same way, so it presents, it's a little harder to do the same type of emergency.[So there's no dimmer on it?] Naah, not like the G1000, you can't just dim it down, unless they've done something in the last 9 months, 9 or 10 months. It, the Avidyne system works a little different. Most of the airplanes are going to the G1000 and even the Avidyne systems are picking up qualities of the Garmin that they didn't have before so it's a lot more user friendly. Instead of going from Avidyne to Garmin, there's more Garmin bleeding over into the Avidyne systems now. They don't call it that, they don't call it Garmin. But more of the same flight characteristics. [With the new systems, do you require demonstration of any special system failure, troubleshooting, or demonstration with troubleshooting or failure analysis?] We have to, we have to, give them system failures, sometimes tho we have to verbalize it. This system has failed. Now what are your procedures? Or, this is what you are encountering what are your procedures and what will you do? But we can't always fail the system. [I've heard that before that there is a problem that you just can't pull breakers.] No, we're not supposed to pull …the manual says it's not recommend to pull the breakers. So, it more that you have to verbalize it, a lot of it. Which is okay, this is, this is what you're encountering. And we can simulate the failure, but we can't always actually fail it.

ICM File 11012807_06.MP3 dtd 1/28/2011

[We had a question on the interview about the teaching higher order pilot skills and actually 85% of examiners responding thought that more emphasis be placed on higher order pilot skills. Of those skills, what needs to be taught and tested at the private pilot level?] Omm, I'm not sure which skills they were talking about when they are talking about higher order pilot skills.[I think it's more like CRM and so forth.] okay, well, ahh..I think that actually that's being empathized quote a bit. Even single pilot resource management is tested now. Before in the PTS CRM was not in there in the same way neither was. Ahh it's in all the new PTSs now –single pilot resource management is listed right under the task, it's no just listed as a little, you know, nice to know thing. It's a required testing item. And also icing, as consider, is more of a higher order pilot skill because knowledge of icing, contamination, deicing, anti-icing. Omm, that was not listed either and it has been added on a lot of the PTSs. So, what we didn't test in the past we asked more rote answer questions in the past. I would say 8 10 years ago, until the last several years we were asking more, ah, rather than- explain this, how does this work, or what's the

correlation between this and this, we were asking them more, what's this and they tell us, what's this and they tell us. And, and we asking more scenario. Scenario based testing is really taking in a lot of that, higher, what I think you're talking about, higher order. [okay] And again, Mr. (name removed) was the one that brought the idea of more scenario based training in this area. Because it's hard to do scenario based training if everyone is doing training based on the old way of testing. [okay]

ICM File 11012807_07.MP3 dtd 1/28/2011

[Do you think it's important for pilots to know, understand, how the system works?] Yes. [Is there, how much, what depth of understanding behind the logic of these machines?] Well, I don't think they need to know how to build it. I don't think they need to know, in the old days, where they used to have to draw the schematics of the electrical things. I don't think they have to go to that extreme, but I do think they need to understand how it works. So if there's a malfunction, they know it's not working normally and they also know in turn what to expect. Because it's going to give you a predictable outcome, but if something is not working properly and you don't know what to expect, you don't know what you're supposed to be doing. And there's a cause and effect to all of it. So, I really think even with the new, new technology, particularly, they should know, they should know how it works – yes. [okay]

ICM File 11012807_08.MP3 dtd 1/28/2011

[From an examiner stand point, is there anything that the FAA should provide to designated examiners to aid them in their duties assigned?] Well I have a good suggestion, I think, but I don't know if anyone else would agree with me. Every two year we (DPEs) have, FAA, a whole day of training with two FAA inspectors that coming from Oklahoma City. In fact they're coming to (location removed) in March. We do a whole of training with them. But what they do is they send two people to show power point presentations and give us a little test afterwards to make sure we're listening. They stamp the foot thing to make sure we are listening, so that at the end of the day we can circle the right bubble thing. And pass our test, and go away and they come back again in two years. We never, last year for example, we asked them let's talk about light sport pilot. Because that a whole separate thing. Let's talk about testing for sport's pilots. Well we don't know anything about it. We're not prepared for that. They're never prepared for anything that a real concern to examiners. They have their little agenda. But their agenda is 20 years behind what's going on in the field. [Yeah, yeah I can see that. When it comes to the technology, what do you think you would like to see in a clinic or whatever? Is there anything specific you can think of off the top of your head?] I could tell you exactly. Our FISDO for example was extremely helpful, two years ago we said we have questions and their true concerns to all of us. Rather than us show up for an all day things at the FISDO every other year thing how about we send you a list of some concerns we have, we would like to discuss, there not, it's not controversial or adversarial. It's thing we don't know the right answer is you might not know either. But let's come to some consensus that might be. [Could you give me some examples?] But, yes. Some examples were: how do we want to create failure of the G1000, ah, another example, ah was…give us, show us now that 141 schools have operations specifications, like charter operators, show us what they look like, so if we are working with somebody with a 141 school, and they say these are our, we just want to know what they look like and how to review them if we need to. To find specifics, for example, if they say this ground trainer is

approved in our ops specs, where do we find that, if we have some question or doubt. And so, we have these questions that we would like to go over with you. But how about, if we send you our questions ahead of time? And you can take as little or much that you want, but let's go over stuff that really is a concern of us. [okay, can you think] So a couple month ahead of time, another question I had, we also always us IACRA, which is the electronic application process, [mmm] Once in a while we can't use IACRA because of some reason, for example an ATP candidate got his military comp certificate at the FISDO the day before and now he's going for his ATP, he won't be in the system. We can't use IACRA. Mmmmm, there are no typewriter any more, if you try to find a typewriter in (location removed) – good luck. Ammm, is there anything, software we would be allowed to use that would just be like a certificate. Not something we can do anything with, but with something we can use, we could actually go in our computers and create a certificate for him. Because the FAA has that software they use, it's not part of any application process. It's just a form. Could we have the same form? Because, typewriters are a thing of the past. And things like that. We sent everything in and we had a whole day session with the FAA, it was very productive, they actually addressed, ahh the issues and we're trying to find some more answers, and we've been kind of had a dialog all year. They were, the local FISDO was way more helpful than the two little men coming from Oklahoma City to do the examiner seminar. We just sit there, and the little guy from, and one of them said he just got in from (location removed), I just transferred, and he did not know a thing about , he knew nothing about anything! He was just clueless. And nice man, so we just waited patiently and wait for them to get through and go home. But they were of no help. We had to pay for these seminars. [If something else, you're time and effort to get there and] We paid $150. [Ooo whal] We have to take an online course and we have to get that certificate and that enables us to sign up for the other one. And yet they always send the two people that know the least. Where years and years ago, there was a gentleman name Mr. (name removed) in Oklahoma City and another guy, ??Mr .??, but they came around, new stuff, they really knew stuff. And they were with it. And they were a great help. And now days, it's like, this like they are just checking the block and they seem to send the people that know the least. This little roving thing. Maybe it's a job nobody wants. But if they're going to send two people, they really ought to send people that know something. [Well, that interesting.] Yeap, these two little people go out, their little, their little, ahh roving seminar thing and you have one full day with them. But you sit and listen to them read off of a stupid power point, they read to you. They just read the words off a power point. They could just put it on a computer so we could do that. I could just stay home and do that.

ICM File 11012807_09.MP3 dtd 1/28/2011

[Do you have any other comments that you would like to share, anything having to do with the technology that we haven't talked about so far?] mmmmnnnn, No.

Interview # 7

1DI file 11021606_01.mp3 dtd 2/16/2011

[The questionnaire indicated that 64% of examiners were satisfied with the current guidance and regulations for certifying new airmen in Advanced Technology Display. What changes, if any, do you think may be needed?] Well I still feel the same way. I just don't think, omm, you know, I think we are talking apples and oranges when you're talking about round gauges versus the flat gauges. You know what I mean? [Yep, omm, is there anything specific that might address it? PTSs need to be written differently.] I was just reading the PTSs here lately. Om, you know, you're asking that are so broad that's it's really hard to answer. Okay? Repeat that question again? [64% of examiners were satisfied with the current guidance and regulations for certifying new airmen in the Advanced Display Technology equipped aircraft. What changes, if any, do you perceive may be needed?] Well, first of all I think probably, first of all I question the question. [Okay.] The bottom line, the bottom line is, if a man goes out get trained in a flat screen and we give him a test in a flat screen, like think 64% of us would agree that's correct. [Okay] A guy get rained in a round gauge and goes out and gets a test in a round gauge, I think 64% would agree that's fine. But I think if you say, well we trained in a round gauge, is he ready to go out and fly a flat screen? I cannot believe 64% of the people would say that's fine. I, I just, I just can't believe there would be that much ignorance. I fly these things on a regular basis and it ain't fine. It's something that needs to be gone over. Now when you train in a round guage, and you get in a flat screen, there's no doubt you can fly the airplane. Because the flat screen is like flying a video computer, it's very easy to fly. What happens when you have so much data at your finger tips on a flat screen, that now you start digging in the data, and you quit flying the airplane, and you tend to over fly your check points, and not turn at your intersections, and things like that. Because you're so busy with the gee wiz stuff. [Okay, I have some specific questions that go right into that.] Hold on. When you train in a flat screen and you go get into a round gauge airplane, I can't believe they can even flying the dog darn thing. I guarran dog darn te ya, I give you a 50% rating if you give me a flat screen trainee and go throw him in a 172, and go do some unusual attitudes, and let's do some work, I bet he can do it. You know, half the people in the world can just fly. Okay, you know what I mean. When you're dealing with students, omm, half of them are so gun-ho that by the time they get up to working on their instrument rating, they study everything there is to study. And so sure they can make it. But the, you know, half the people don't. Half of the people only do what they are told. And that's the problem with the round gauges, they're hard to fly. There back in the old days, where it's hard to fly. Where you're flying a flat screen, it's like a video game. Now going on with your question, what changes would I make to the program? I would definitely require at a minimum a logbook entry for the one of the other. At a minimum from a Certified II is a minimum that needs to be done. If I give you a test in a, you know, flat screen then I think you need to have a flat screen endorsement. And if I put you in a 172 with round gauges, I think you need to go up with an instructor, and have a round gauge endorsement. You know and vice versa. I get really do. I think this should be necessary. Omm, I'm an examiner and I feel the same way about a piper Seminole, counter rotating propellers, versus going out and getting into a Baron or 310. A Seminole or Dutchess, and all these sort of things, I don't see how they qualify for multi-engine ratings. They don't do VMCs, they barely stall, but you go out in a Baron or a 310, and that thing

will kill you faster than you can say boo. And the FAA and most examiners don't agree with that either. They just say, (garbled), airplane's and airplane if it's got 2 motors it's a multi-engine rating let's go. And omm, so you know, there's certain of us believe that you can just go out there and get training and it's good for everything. There's certain of us that agree that your training needs to a little bit more aircraft specific. Because, we're just trying to lean over on the safe side. And I've always been a semi-opponent of the AOPA, not proponent. Because the AOPA wants everybody to fly everywhere, all the time, as easy as possible. And that's all gee wiz great for all the private pilots that want to go out there and fly with themselves, 1 mile visibility and clear of clouds. But the fact is that's dangerous and I'm not an advocate of that. And the AOPA is such a strong advocate of keeping our rights, they go 1 mile clear of clouds, legal, go fly. You know, so, I'm the guy that says, you know, really and truly if you don't have 3 miles out there or something close to that , you know, you really need to have an instrument rating, if you're going to be doing special VFR. You know, a mile or less visibility is horrible and clear of clouds means you're scud running. That's all there is to it. But the AOPA is a proponent of that. Same thing goes for the multi-engine ratings, where they go, hey it's a multi-engine rating, the FAA limits centerline thrust, so what's the big deal. And I think that same attitude is what's driving the round gauge and flat gauges, what's the difference? They're all instrument flying. That's the issue I see right there. Until we start killing people, we're not going to have that extra edge of safety. I've got the same problem, I was flying a King Air just about 3 or 4 months ago, and low and behold I'm about 20 something thousand feet, and guess what? There's a Pilatus up there asking for his IFR clearance. You know what the controller said? Well, sir, I'm sorry but you're going to have to descend down to 17, 5 or below before I can give you a clearance. The guy was in the 20s! VFR! Okay. Swaking 1200, nobody knows, and basically tells on himself. And dame gonit I didn't get the N number written down so I could follow up on it. I wanted to make sure he got violated! I never heard anything about the violation. I was trying to follow the frequencies to follow him. That's what's going on when you got a guy that's got $3 Million in his pocket. He goes out and buys him a Pilatus and he has a private pilot license. He jumps into the airplane and goes straight to 25,000. He doesn't need and instrument when it's VFR. [The world's a crazy place.] Well, well that's what's going on in safety versus regulation. You know as well as I do, there's nothing unsafe about 25, 0 in a Pilatus, other than we're all up there thinking that we're all IFR and we're being separated. We're not looking for each other. [Yeah.] The fact that he's up there. He probably had TCAS, so he can see all the transpondered airplanes. And we can probably see him, because we have TCAS and we can probably read him off at altitude. And they'll say, oh well he's not on our screen or whatever. But the fact is, that mentality is what's driving the, oh no, we don't need any difference in this stuff. It a tough road because, you know, we're living in the raw raw raw freedom. I mean this is America raw raw we all want to have free airspace and all the rights we can have. And we all agree. But then there's another thing, the fact that, especially around these cities, these airspaces are cluttered. And omm, you know, we've got to set a little bit higher standards. So anyway let's go on to the rest of the questions. [Okay.]

1DI file 11021606_02.mp3 dtd 2/16/2011

[Specifically with respect to pilot experience requirements, you know hours, or flight times, or number of cross countries, do you perceive any changes needed as a result of the technology for pilot experience?] No. [Okay]

1DI file 11021606_03.mp3 dtd 2/16/2011

[Results from the questionnaire indicate that 81% of examiners perceive that conventional navigation skills have been degraded as a result of the technology. How should training and continued training be changed to insure proficiency with conventional navigation skills, like pilotage and dead reckoning?] Well, I think the how is not the problem with the question. It's a matter of why in the heck aren't they doing it anymore. They're not doing pilotage and dead reckoning. When a student pilot gets into his airplane, he learns, the first thing he learns how to do is dial up his Garmin 430 or 530 GPS. He doesn't ever learn dead reckoning, pilotage, none of that stuff, none of it! He just gets into that airplane, sure he draws his map on, draws his line on the map. (garbled) You know, aviation 101 ground school. When he gets into the airplane, he dials in the GPS, and flies the GPS course. So that's what has happened to pilotage and dead reckoning. They just flat don't do it. And omm, that's all fine and dandy as long as all your stuff is working. Now when your stuffs not working, now you have a guy out there that doen't have a clue where he's at on his map. Doesn't know how to read his map. Ah, doesn't know how to tune in his VOR, get his radials, and do cross radials, and find out where he's at. He's, you know, just there basically pretty stupid. Because all they've ever done hit DIRECT TO so and so. Even if it's a VOR, or whatever it is, it's DIRECT TO so and so. They fly to it, and while they're on the way, the instructor will tune in a VOR or they'll tune in the VOR, Okay here's your cross radial. Oh that's cool. I gave a test just last week and he failed. He said, omm, I said omm, I see here your airplane here flies at 110 KTS. He said, yes sir. And I said, well, you going to fly 110 KTS all the time? He said, yes sir. I said, well does this airplane have any climb charts? He said, well yes sir, there's some in the book but I don't have a book so I've never done that. So for climb fuel, climb speed, climb distance, he'd never done that. I said well, you know, you obviously did it on your written, so let's, let's, here's my book let's see what you can to with that. Well he fiddled his way through it. I said, okay, I don't really care about 2 or 3 minutes, I just want to make sure you sure you know how to do the climb fuel, climb distance, and so forth. Yeah, yeah, yeah. Alright, I want to see weight and balance. Oh, I haven't done a weight and balance yet. Well, okay, I weight 170 pounds, you know, I have 25 pounds of baggage, and I'll be back in about 5 minutes why don't you have me a weight and balanced knocked out. Okay, okay. Whips out the flight manual, you know, the (garbled) and uses the sample. Didn't use the actual aircraft empty weight. Uses the sample. 1262 pounds instead of 1408 pounds. And so I saw him do it, I just went on and let him do it. And make sure he did his weight and balance wrong, of course he had to fail because he did not know his performance and he did not know his weight and balance. And so I said, you know, have you ever done weight and balance before? And he said, no sir, they showed me how to do it on my written, this airplanes has 2 empty seats in the back, so we have 3 or 4 hundred pounds under gross, so we don't worry about weight and balance. So I've never done one. [mmmm] The same thing goes with navigation. They're just

flat not doing it. That's the problem. [Okay] Examiners have got to fail these students that don't know how to do it. So, what needs to be done? Examiners need to test them, and if they can't do it, they need to fail them. Still that's our only recourse we have right now. It's already in the training programs to teach them pilotage and dead reckoning. It's already in the regulations. It's just that flight schools are not teaching them. And flight schools have their preferred examiners that don't test them. Of course by the time they get to commercial level, that's where I usually get them, oh they can do a cross radial and VOR. They can do pilotage good enough and they can read a map. You know, give me a break, once they've got a couple hundred hours, they can do that. But you take a guy that's got 50, 60, 70 hours and he's just now going out there on his own, omm, he, he doesn't have the whole picture yet. And he just can't do it and he hasn't been practicing it because his instructor has been so hard on teaching his to do takeoffs, landings, stalls and stuff like that. That he really hasn't been really teaching them the basics of navigation. Which is, well, we'll call it IFR – I follow roads. You know, ah, basically they don't know how to look at the ground and fly. They're all looking at their TV screens and flying. And it simply needs to be tested, and disapproved, and make the instructor go out and retrain them. But the problem there is the student cost him an extra $1000 and the instructor makes an extra $1000 by not training this guy properly. [Okay] You catch what I'm saying on that? [Yeah] If he'd been instructing him properly in the first place, he would get the additional money after the failure. [mmm] And it would cost the student the extra money. But the fact that he didn't do it right the instructor gets rewarded. [ah, okay] You never thought about it, have you? [No.]

1DI file 11021606_04.mp3 dtd 2/16/2011

[Advanced Display Technology has the ability to alert and aid pilots in potentially serious situations warnings, alerts, and so forth. At the private pilot level, what features and capabilities should be taught and tested?] Tell me what this advanced program you're talking about is? I'm not sure I know exactly. I want to make sure I'm talking about the right subject. [The new G1000 and so forth. I mean] The G1000 they have traffic on them, they got terrain on the, all that gee wizz stuff on them. [How much of at the private pilot level do they really need to know?] Ah, you're talking to an older guy here, you know, I'm an older guy, I'm not one of the 30 some things. Because they are using this advanced technology in place of looking out the window, and knowing where they were at, they need to know it thoroughly! Because, if they would look out the window, and knew where they were at, and where they were going, and what was going on, and use the G1000 as a reference, that would be a little different story. But these people are relying on these G1000s and these Avidynes for everything - obstacles, roads, lakes, VORs, everything. You know, so that's the problem, they are relying on them so heavily, that by dog if you're going to relying and get into the airplane with me, you better make that sucker walk and talk. [That's really good. That's insightful! I hadn't heard that. Thank you very much!]

1DI file 11021606_05.mp3 dtd 2/16/2011

[How might training and testing address issues like automation surprise?] Automation what? [Automation surprise. When the unit starts beeping, and they're not paying close attention to what's going on.] I say, at least half of my check rides, I ask them what a beep is, what a certain deal is, and in variably, they go, I don't know but it does it all the time. So, ah. [That's horrible.] Oh yeah. It just

happens all the time. The thing I was concentrating on, on this last deal, I just gave a round gage test to a 300 hour pilot that did a wonderful job. He was doing such a good job that I was reading the PTS a little bit, while I was waiting for him to shoot some approaches at get between points, you know, and just totally had his act together. Ommm, it said, if that airplane has an autopilot in it, the guy need to know how to use the autopilot. And omm, you know, the bottom line is most of these planes I'm flying, like the Cirrus SR22 [mmm,mmm] All they can do is turn the autopilot, it's a wing leveler, is all it is. They can turn the autopilot on, it can hold a heading, it can hold an altitude, it can track a course. And that's all they know about the autopilot. You can ask them a few questions. Oh, yeah. You can't use the autopilot with the flap extended beyond 50%. And that's their extent of knowledge about the autopilot. What's minimum altitude for use of the autopilot? What? They don't even know that it's a limitation for the use of it. You know, they, they, these autopilots, you know, basically just like you got (garbled) autopilot on and the rest is history. They don't do anything the rest of the flight until it's time to land. They need to know how to fly these autopilots. Tremendously, they need to know the warning systems and the failure indications. Thoroughly! They need to know them. I mean, what's the use of having the warnings and the failure notices, if you don't even know what they are? And they're in the book. You know, they're all there. It's just a matter of being taught and ah learning it. I'm fortunate that I deal with (name removed), which is now called (name removed) Academy, there out of (location removed), ah somewhere around (location removed), and they have very good, very good program. And they get about 80%, that's what I give them, as far as their automation technology training. But they own (name removed), you know a (identifier removed) manufacturing company. So therefore, they're into the technology and I give them about 80%. About 20% they are still missing because they're not going real deeply into it, but at least they are going 80% into it. They're getting pretty good. Ah, so I'd say 80% is as good as it gets right now for the automation technology for warnings and all that stuff. And it just flat needs to be taught. It just needs to be, not a word for it, curriculumized! Okay? [mmm,mmm] We need to have a curriculum and lesson plans on these warnings. And they're just not doing it! And that's the number one problem with Part 61 training centers and training facilities, because they really don't have a curriculum. They really don't have training lesson plans. And so they kind a get into the airplane, this is the way to turn it on, this is the way you do NAV, this is the way you do HEADING, this is the way you hold your altitude, any questions? And when a beeper comes on, they go, what's that? Well they'll look that up. And they'll tell you what that beep is. And that's about the extent of it. So we need to get some lesson plans and curriculums that actually address these higher technology warnings, and autopilot warnings, and autopilot usage. Because, let's face it, it all here, that's the way the world's going, and ah let's use it. Like I said. [Okay]

1DI file 11021606_06.mp3 dtd 2/16/2011

[On a similar note, you've been working around like a lot. Results from the questionnaire indicate examiners perceive that the technology has created an environment of risk taking behavior, flying lower visibility or over reliance of technology. You've already kind of touched on that.] Well I'll touch on that a little bit further. [Okay, please.] What do they call it synthetic vision? I witnessed a guy in an airplane with a Garmin, I believe they call it a Garmin 600, (with) synthetic vision. Right. He's flying in the clouds VFR low. The only thing we don't see is the cars going down the roads. We see the roads, we see the

rivers, we see the lakes, we see the towers, we see the mountains, we see everything in his synthetic vision. And he was bragging about how cool it was. We were in the clouds, we were VFR on top, and I was expecting us to get a clearance and go down through the clouds. And ommm, we never even thought about getting a clearance. Omm, we had traffic, he had synthetic vision, and hey he was in control. He was even talking to approach control. (laughing) He just didn't tell them he was in the clouds. I'd have liked to have crapped in my pants. I couldn't hardly believe it. [What do you think we can do about it?] Omm, that is the question. What can we do about it? The same thing, ah, that applies there, applies to LPV approaches, ommm, because there are LPV minimums, and because a lot of these things have lateral guidance. On my test now, I test all my instrument students on the difference between lateral guidance and LPV approaches. And omm, I would say at least 80% of them, and I have got some highly trained AeroSim pilots, 80% of them know they're supposed to stop at the MDA just because their instructor told them and they don't know what it really takes to get down to LPV minimums. And I think, that's just because I'm in the group of heavily educated kids that know they're supposed to stop. And I think you have equally the amount of these uneducated people that say hey, it says right here we have a GPS to 13, and my lowest altitude in 250 feet, that's my minimums, let's go! LPV, let's do it. They ain't got a clue of what WASP really is. Omm, they just don't know the rules. This kid I just tested the other day that I told he did so good, he did a wonderful job in a round gage airplane, and so omm as we was going he's last, you know, we did our VOR approach, we did an ILS approach, we did a GPS approach, and we did a localizer approach. And so omm, on his GPS approach I said okay you're going real good, how do I know and how do you know that this GPS is in the approach mode? And he goes, it does it automatically. I said well, how do you know it's in the approach mode? He said, well, he did it automatically. So anyway he did a perfect approach and he was in the approach mode. But he didn't know until we were on the ground and we talked about it some more that those little lights up on the dashboard that said APR (laughing) meant it was in approach mode. [Okay.] You know, if it's in the ENROUTE MODE that's a 3 mile mode, if it's in the TERMINAL MODE that's 1 mile mode, if it's in APPROACH MODE it's in 0.3 mode. And that's the only mode you can shoot approach in. So he was in the right mode, he just didn't know it. [Do you think it all goes back to good instruction and testing them for compliance?] I think it goes back to the curriculum and the lesson plans. It just wasn't in the lesson plans. He was out there shooting approaches one right after the other and he was doing a great job. It's just nobody ever pointed out the lights to him. Just like I was talking about the beeps and warning a while ago. [mmm,mmm] Nobody ever told him. [Okay.] And that's the issue, the curriculums and lesson plans just don't cover the data. [Okay.]

1DI file 11021606_07.mp3 dtd 2/16/2011

[Another similar note, 85% of examiners thought that more emphasis should be placed on higher order pilot skills, you know like single pilot resource management, and how much of that should be taught and tested at the private level?] Well, I don't know whether I agree with the 85% thing. I think 85% of examiner are going to say something like that. Just because of Rah Rah Rah Rah. You know, safety, safety, safety. Everybody needs to be better. That's the big new thing now – cockpit resource management. Blah, blah, blah. The bottom line is, these single pilot operators we're talking about, private pilots flying single pilot, om, the instructor's not supposed to help them in the first place. I never

helped my student at all on their check ride. Well they ask me, if I'll take the airplane while they get a chart out? I say no. And om, I never had any student losing control of the airplane or anything. As far as keeping his cockpit organized, all that kind of stuff, I'm, well of course it could be better, I think 85% of us would agree, oh yeah we always need to be better. But is there really a deficiency there? I don't think so. I think we're doing pretty darn good. Because, most instructors don't really help you do your approach. They might help you hold a plate, you know, while you get your plate thing. They hold the yoke. Simply because you're a student pilot. Ah, I don't just see single pilot cockpit resource management, when you're up there single pilot, you're usually ahead of the ball game. You got your charts out and you're ready for the next deal. [Okay] I just, ah I think that may be a little bit, you know how it is when you're asking questions and general how people answer things. I think that's would probably one that's up. They're just erring on the side of safety. So they answered that 85% of us thought it could be better. Yeah, sure, I agree with that. What can be done, well just keep them (garbled), you know, more resource management. I mean. [Okay] This kid the other day, omm, he had it totally together, 300 hours, I'm flying along there, he's doing real good on approach. So what am I going to do? I send him to an airport he didn't have an approach chart for. I mean, that's what you do. So he had to get his books out. Fly the airplane. With his gyro out, because he was on partial panel. And he had to get his book out, and go to an airport he hadn't been to before while he was trying to keep it right side up. And I did that because, if he knew where he was going in the first place and the point is he lost his gages and he wasn't going to make his destination. He needed to go somewhere and land. So now you got to get your stuff out while you try to keep this thing right side up. And he did a very good job. You know what I think, you can overwhelm anybody. But I just think this cockpit resource management thing is a kind of a new buzz word thing: kind of like. What can we do to stop runway incursions? [Got it!]

1DI file 11021606_08.mp3 dtd 2/16/2011

[Should training and testing require applicant to know how the system works? And I'm pertaining to the G1000, and to what depth of understanding should a private pilot be required to know?] Well I go through this all the time. And I always ask the question, and most of the applicants understand that they have to know they have to have a certain number of satellites, and blah, blah, blah. And so, let's face it, have you done any research on what a laser ref gyro is? [Ah, I'm actually a navigation engineer for the USAF.] So you should know that there's practically no data out there for a private pilot. [It's mostly all proprietary.] Exactly! Works real good. Last a long time. And that's about all they'll tell you. Does it bounce off mirrors, does it bounce between this, nope, it's there in place of the gyro. Works real good. Last a long time. If it ain't working a light comes on the dash and you get a big X across the screen. Well, where there's a gyro, hell we had to know the number of RPMs it was, whether it was in the vertical plane or lateral plane. You know, we had to know all this crap! Laser ref gyro, turn it on, it works. That's about all you can find out. And ommm, like you said, they got a little bit of data out there now. If you do a whole hell of a lot of research, you can find out a little bit of stuff. But ah, you just can't find out how are system works. You really can't find out how a GPS works. You know they can say you gotta have 2 or 3 satellites or it's gotta have this. You know nobody really knows how they work. They call it PFM – Pure Frickin Magic. [laughing] Works real good. Last a long time. Yeah, so I ask them how the system works.

And most of them tell me they gotta have 2, 3, or 4 gyros, satellites. This that and the other. And they come up with some stories, you know, what am I going to do? Tell them they're wrong? I don't know either. [Okay] I mean, you know, how many satellite we really got to have? 2, 3, 4, 5, 6 I know the more I got the more accurate it is. But when does it really kick off? Ah, you know, what do they call it? The warning we all check for on approach, approach plates? It's on our GPSs. What do they call that? Now come on. What's that buzz word for your integrity? [Oh, yeah.] What is it? What's the word for it? [I'm trying to remember myself.] Yeah, well the bottom line is the GPS tells you got it or you don't got it. [Yep, yep.] You don't got it, you can't shoot the approach. [Yep] You got the integrity, then you can shoot the approach. Well what do you have to have to have the integrity? Well I don't know! So how can we expect the student to know? [Okay] That's kind of a loaded question. Of course we need to know how this stuff works. But if we're going to know how it works, then the data has to be available for us to learn it. And the data isn't out there because it's all Top Secret. [yep] We don't what the whole world to know how it works. But as far as knowing, how to operate the system? Yes. As far as how many milliseconds it take these signals to beep back and forth between satellite to satellite and all that stuff, I don't think that's nearly so important. How does a VOR operate? How does a DME operate? You know the bottom line is, if you can't twist it or touch it in the cockpit, what to you need to know it for? [Okay] I've been a long time, I work on airplanes, I'm not a mechanic, but I work on them, you know you got one King Air that say that light come on at 5 PSI, and you have another manual that say it comes on at 10 PSI. The fact is, we don't have a PSI gage; all we know is the lights on. When the light comes on, you flip this switch. Because, we don't have a gage. Low pressure fuel light, comes on at 5 pounds or 10 pounds? I don't know. But when it comes on, it means you got low pressure on your pump and you have to turn on your boost pump. Turn on the boost pump and the light goes out and you're in good shape. Turn the boost pump on and the light doesn't go out, then you gotta start counting getting your 10 hours against your motor. So what good does it do to ask a guy whether it comes on at 5 pounds or 10 pounds? [Good, okay] Your book says 10 pounds. My book says 5 pounds. I'm going to fail you because you have the wrong book? So, I don't think we need to know how to build them is my point. [I follow your logic on that perfectly.]

1DI file 11021606_09.mp3 dtd 2/16/2011

[93% of examiners required demonstration of specific feature with the new G1000s and so forth. What specific features do you require when you are doing a PT with a private pilot applicant?] Well, ah, I don't require anything specific, ah, maneuvers. You know, we have to do VOR tracking, intercepting. Therefore, you got the G1000, ah you generally do point to point using the GPS, navigation, and you do intercepting and tracking. Ah, of course we do unusual attitudes, any level of piloting, you put them under the hood, and make them fly straight, do turns, do unusual attitudes. Ah. [So you just follow the PTS?] Yeah, you know. A lot of these people try to come up all these special gee wizzz things. [Okay] And try to throw on them. Ah that's why I say the examiners get hooked up with the flight school and start trying to pull this stuff. And I try not to do that. The bottom line is they start talking about specific failures of the Garmin 1000 or the Avidyne system, and you start pulling circuit breakers and disabling the unit, ah, that's strongly frown upon these days. Them suckers are worth hundreds of thousands of dollars. And you're out there pulling circuit breakers, and resetting circuit breakers, and surging that

electrical power in and out of those circuits. You ain't doing no one no good, except setting them up for a fall later when they're out there in actually conditions. [okay.]

1DI file 11021606_10.mp3 dtd 2/16/2011

[Just about what you were talking about, should applicants be required to demonstrate system failures and troubleshooting with the technology? If so, what system failure do you try to demonstrate or ask them to troubleshoot?] I specifically discuss loss of navigational systems. Okay. You got a Garmin 1000, how in the world do use lose a VOR indicator on a Garmin 1000? What's your backup? You can't test that. It's not testable. You can't fail that portion of the Garmin. So I verbally ask them, do you know what happens when your laser gyro goes out? How are you going to keep the thing right side up? How are you going to work on the heading? Of course you go back to compass flying. What do you do if your VOR indicators go out? Those kind of things. Simply waddle our way through loss of indications. And omm, what I really looking for, especially on the private pilot level, they better be able to turn the darn thing off, black the screen down, you can take those things to almost blacked out on dim, and they better be able to fly that airplane back to an airport. You remember when we were talking about dead reckoning? [Mmmmm,mmmmmm] They better be able to fly that back to an airport. They better know attitude flying. They better know the basic sound of their motor and fly that airplane back without airspeed, without any engine instruments, or anything. That's what I look for. Because when that screen goes black, and we have an electrical failure on this airplane, can we get this airplane back on the ground? Now if you're on a instrument level, it's kind of a BS question, unless they have all the backup gages down there. With backup attitude, altitude, and air speed so they can work on that stuff properly. [Okay.] You know, essentially, you know I don't think there's any backup power gages on the engines are there? You know, most of these things have airspeed, and attitude indicator, and altimeter round there somewhere. They're like little itty bitty ones around the airplane. I don't think I've seen any with backup power gages. And omm, that's what I want them to specifically do. Be able to say okay we just lost this stuff, now let's just fly this thing back over there and land it. Let's just get it, fly it over to an airport, let's get it in the pattern, and get it on the ground. Because a lot of these kids all they know is, ah this power setting will give this airspeed. Boom, boom, boom, boom. And that just drives me up the wall. They just need to know to basically back to flying. I've always covered up airspeeds, altimeters, attitudes, and headings on all check rides, private pilots included. To make sure they can just fly the airplane. So I do the same thing with the Garmins and Avidynes. I just blank them out. When I do chandelles and lazy eights on a commercial ride, windshield black. [mmmmm,mmmm. Okay] They need to be able to fly the airplane without the TV screens and without all their gages. So that's the failures that I give. You know, I basically black them down. Because, you can't be out there pulling these circuit breakers. And that's the whole problem. There's procedures for push out and down. Most of us are very uncomfortable and we feel we're abusing those things, whenever we start pulling those circuit breakers and resetting those circuit breakers. Most of those thing with the laser light gyros won't reset in flight. You got to go back and land somewhere and wait 5 minutes to reset them. [Absolutely.]

1DI file 11021606_11.mp3 dtd 2/16/2011

[Related to what we're discussing right now, other than partial panel, what else is difficult to perform during a Practical Test?] Other than partial panel…ah. [You just discussed that. It's kind of a moog point.] I think everything I just said covers that. [Okay] Power Gages would be, you know, my, my bullet point on that. [Okay, got it.]

1DI file 11021606_12.mp3 dtd 2/16/2011

[Ammm, as far as examiners, 55% of examiners, ah, thought the FAA should provide more training with Advanced Technology to the examiners. Ah, do you agree with that? If so, what training would you like to see? This is for you.] As far as examiner training? [Yes, sir.] Well, omm, you know, I don't, I would have to say that as an examiner during our examiner classes that we take every year, you know, we have to take a recurring class every 2 years, and we have to take a local class every year, they go over that every year – Advanced Technology, Technology Advanced Aircraft I think is what they call it. And so we discuss that. As far as training, ah they give us a little, yada yada, we talk about it and they show us a few slideshows. But I'm one of the few, and the FAA was blown away, whenever I got checked out in a Cirrus. I sat down with an instructor for 4 or 5 hours. And there was a, I received a slideshow just like FlightSafety, or SimiFlight, or anybody else gives on the whole airplane. Ah, but a considerable amount was on, you know, how the avionics works. And when I got with my FAA guys, my managers, they were very surprised that I recommended that they not go fly a Cirrus! You know, they can just go rent airplanes, They do that, they call it IBC training or something. [Okay] (Grabbled) They receive their currency. I recommended to everyone of them that they do not go rent a Cirrus without first going up with an instructor and receiving some flight training and receiving some ground school. And they were all surprised that I recommended that. And, ah, none of them recommended me go do that before I examined in those airplanes. But the FAA in our seminars do suggest strongly that we do get training before we do it. They do it mainly from a liability point of view. Because they don't want you going out pulling circuit breakers and messing up a system. And them guys calling the FAA saying, raising hell. Hey your FAA examiner messed up my airplane. [Okay] That's their direction whenever they talk to us mainly. [Okay] How can you test it if you don't know it? You know, they always run on that.

1DI file 11021606_13.mp3 dtd 2/16/2011

[Just to wrap up, is there any comments, or recommendations, or concerns you might want to offer on this particular topic?] No, I think we covered it pretty well. You know. I think you have a pretty good handle on it.

Interview # 8

1BB file 11021807_01.mp3 dtd 2/18/2011

[The questionnaire indicated that 64% of examiners were satisfied with the current guidance and regulations for certifying airmen with all the Advanced Display Technology. What changes, if any, do you perceive may still be needed?] Ah, okay, wish I had some time to think about it. I, I don't see any changes, I can't think of any changes needed to be made at this time with the current present technology that we had. A far as, are you talking about glass cockpit? [Yes, sir. Is there] I can't think of any at this time.

1BB file 11021807_02.mp3 dtd 2/18/2011

[Specifically with respect to pilot experience requirements, flight hours, cross countries, and so forth, are there any changes there that might be needed?] Cross country experience, could you repeat one more time? [Is there anything with respect to pilot experience requirements that might need changes?] Ammmm, no. I, I don't think that pilot experience is necessarily, the issues I've seen related to glass cockpit is primarily been related to a lack of knowledge that some flight instructors, flight instructors are the means by which most pilots, ah, attain and learn different systems. And I've had issues with some flight instructors trying to teach people, are teaching in platforms that have advanced technology and there not very knowledgeable themselves. So I think that there may need to be some guidance given, ah, in the direction of flight instructors being up to speed. Ah, but I think as, that's more of an issue that was more valid in the beginning than it is now. But, omm, it times when (garbled) people more and more informed. Ammm. [That's good.]

1BB file 11021807_03.mp3 dtd 2/18/2011

[The questionnaire indicated that 81% of examiners perceive that conventional navigation skills have been degraded as a result of the technology. How should training and continues training be changes to ensure proficiency with conventional navigation skills? Any thoughts?] Absolutely, pilotage, omm pilotage and dead reckoning, is no, is really very little. In some cases, some people are out just flying GPSs. And, flying, going, being, omm being 120 miles or whatever from where they're at and other than being able to instantaneously, omm, attain situational awareness by looking at a multi-function display or display that would give them some indication of where they were at. And if those things were to become inoperable, I would have some question as to whether people would be able to get up to speed in a hurry and keep up with where they were at. So ah, yeah, I think navigational skills have degraded relative to basic pilotage, and dead reckoning, and situational awareness. (Comment about telephone connection.)

1BB file 11021807_04.mp3 dtd 2/18/2011

[The advanced technology has the ability to aid and alert pilots in potentially serious situations. At the private pilot level, what features and capabilities should be taught and tested?] I think that, om, to be able to use the unit. And most of the younger guys don't have issues with that. I think to be able to use it

and be able to readily, ah, in a situation where you need to be able to go to the closest airport. I took yesterday, I gave a private pilot test, I didn't allow the person to use the GPS at all, a younger guy, until we got to a diversion to an alternate. At that time I won't let him use it until he gave me a heading and an estimate of how long it would take to get there based upon the distance. And once he did that, and was headed in the right direction, I allowed him to use the GPS to tweak it up and show me how we would use it in a situation where he wanted to go to the nearest airport. He didn't understand that this was an old 89V and he didn't know he could pull the knob out and scroll through other airports. I was able to show that to him. But, ah, I think that for private pilots, I mean, (garbled) for private pilots they should be able to use it to find the nearest airport and be able to, ahmm, I find a lot of pilots, on the go, with him I said I want you to use the GPS and he immediate hit DIRECT and started dialing in the airport. Well I said that's really not necessary, I didn't choose the nearest airport. But, so, anyhow, [Okay] I find as they're becoming more advanced with the new Garmins and such, one of the problems I've had with applicants, instrument applications, is not being able jump on an airway whatever GPS it is. And so I'll have them join, I'll have you join this airway and have you take me to this fix. And pretend we're going down this airway and try to get to this fix, they're going to be told there's 3 other aircraft in bound and they only allow 1 approach at a time or whatever. And you're going to have to hold at this fix, and the guy would want to revert back to VOR navigation, non-linear navigation, and that's not acceptable. And so ah, with new technology coming out with Garmin, I forget what they call it, you can actually load an airway in the unit. I've had some issues with people being able, ahmm actually load airways. Om, and that's because they haven't been taught how to do it. And so, there again that's where your flight instructors are not up to speed. Ahh, I have a little advantage as a pilot examiner, that where I'm a B triple P instructor, that is a Beech Craft Pilot Proficiency Instructor, and we're standardized – we're required to take the same courses that people participating in B triple P, so I've learned a lot of what I know about various units by going, setting in on, we have these guru guys that are like (garbled) guys that know these things inside and out. So, omm, that's how I've learned it. But I think there should be some required training for instructor's teaching, omm, the various units, some people say boxes. [Okay.]

1BB file 11021807_05.mp3 dtd 2/18/2011

[How might training and testing address issues like automation surprise?] Automation what? [Automation surprise when the units start beeping and hollering at them and maybe they're not paying close attention.] Mmmmm, Can you give you an example of that – beeping and hollering? [I'm just talking about pilots maybe being inattentive and then suddenly a warning pops up and catches them off guard.] I haven't seen that as an issue. Ommm. [That's fine.] I, I haven't seen that as an issue. The biggest issue I have with glass, is glass requires, in my opinion, I've been flying glass as long as it's been in the first glass cockpit I flew was a G1000, and I've flown various, Avidyne. I'm flying a, actually flying a Citation right now as pilot with a Prima System. Transitioning to glass I was very fortunate I think. The first airplane that I flew with glass was the Garmin and we had analog, I don't like calling them steam, airspeed and altimeter as standby instruments. And I at a glance could immediately get my warm and fuzzy back. Flying glass Primary Flight Display with digital indications, oom, even though you have a tape to focus, a lot of time goes on the digital indication. Unlike analog, when you look at relative position of an analog indication whether it be altimeter or whether it be airspeed you instantaneously know

whether you're a little bit off or a whole lot off or whatever. Just by a relative position and even in your peripheral, I think we are, after flying so long we are picking up these clues with an analog indication being in a relative position that gives us an indication that every things okay. Omm, [Okay] With a digital indication you have to assess that number when you look at it and it's not instantaneous. And I think that's caused some accidents. Omm, no amount anyone said, I have people say the new younger pilots are adaptable to this. I think it's our minds. I think our minds, our brains, is easily, more suited to a needle indication or relative position of something on a dial or whatever more than it would be on a digital indication or something. And even though we have a tape, you have to talk to yourself and actually look at that tape because you're focused on a number. Omm, numerous times recently the guy I'm flying with, he's not here now, one of the flights in the last month we got really slow. I was flying as co-pilot and we got really slow in this Citation, and he was up there flying this airplane and we're down below 120 KTS climbing out through about 15 thousand feet. And I sensed it, and I'm head down working the FMS, and all of a sudden I'm like, I felt like we were getting slow. And I looked up, and all of a sudden we were critically slow. And I'm like, you know, Dan we're slow we're slow, we're slow, we're slow. So, ommm, I think that some research, I think more, I think more research needs to be done on how we, omm, not only adapt but how we, how we, are digital representation really the best? [I think that's a good idea. I'll mark that down and maybe someone will pick up on that and run the ball with it.] Alright. [I've got to move on.]

1BB file 11021807_06.mp3 dtd 2/18/2011

[Results from the questionnaire indicate that 70% of examiners perceive that Advanced Display Technology has created an environment of risk taking behavior, like flying in lower visibility. How could training be modified to reduce this risk taking behavior?] Ommm. I don't know if, I don't know if I've seen that glass cockpits, (long pause) [That's fine.] You talking about maybe autopilots, may, autopilots when you say advanced technology, auto, we have, ommm, (long pause) [The main point on this is] I'm trying to figure this out. I've had a couple applicants in the last couple of years that couldn't fly the airplane without the autopilot on. And, ommm, ommm, ommm, and that was, and again that's an instructor's allowing the person to fly, teaching this B triple P you've got in these clinics, 6 out of 10 of them in the multi-engine airplane that had an engine failure right after takeoff on the way to the clinic would kill themselves if it had one. But, omm, I think that, I'll have to think about that. But I would say that advanced technology, advanced technology would be more related to risk taking around an autopilot more than airplanes, more airplanes having autopilot probably creating an environment for that. I, ah, as far as what training might reduce that? I'll have to think about that. [Okay, I can send you a little email and if you come up with something you can zap it back to me.] Okay.

1BB file 11021807_07.mp3 dtd 2/18/2011

[The questionnaire indicated that 85% of examiners perceived that more emphasis should be placed on higher order pilot skills, like CRM. What's your thoughts on that?] Ommmm, I think that, I think that's correct. I think there should be more emphasis put on that. And ommm, I trying to think back about applicants and how they address certain things. And ommm, whether it be ommm, probably at the private pilot level you have, you don't have that many, the instructors haven't taught student applicant

to, say omm, something that doesn't require immediate action, it's, sometimes it's, you have cases where people where you have something immediate action and they'll want to pull a checklist. And you have cases where non-immediate action, say the loss of an alternator or something, and they'll want to go by rote memorization or whatever. Omm, I think some emphasis on, on the applicability of cockpit resource management, ommm, ommm needs to be emphasized when ommm, when immediate action should be taken and to be followed up with good cockpit resource management utilization of checklists whether it be inside or anything inside or out of the airplane to be sure a normal outcome occurs. [Well that's good.]

1BB file 11021807_08.mp3 dtd 2/18/2011

[Should training and testing require applicants to understand how the systems work? And what I'm talking about is all the technology? How much they need to know behind how it all works?] I think you need to know how it works. Omm, without that you just ahhh dealing with a monkey. [Okay.]

1BB file 11021807_09.mp3 dtd 2/18/2011

[According to the questionnaire, 93% of examiners require demonstration of specific features or tasks associated with advanced displays. What features and tasks do you require to be demonstrated during a Practical Test?] With, with a, say a GPS? [Or a G1000 or whatever.] I require the person be able to properly load a flight plan. Understand why it has to be properly loaded. Be able to load a departure or any procedure, whether it be, ommm, ommm an approach, (mumbling) a SEEIT, or a STAR, or any approach . Which if you have a GPS on board, you got at least an approved GPS, you have to conduct 1 GPS approach. Ommm, I find that [At the private level, what would you want them to do there?] At the private level I would want them to be able to, ommm, be able to obtain information relative to airports, ommmm, through, ammmm. They should be able to use the unit, through every chapter of the unit, as well as every page. I don't necessarily with private pilots, I, to be honest with you, I don't require a lot other than be able to use it. Set it up in a situation and be able to go to a point with it. Because, I know that there being over used to some degree. And that's maybe a fail on my part, not to require more. But a lot of these younger guys, omm, know that thing inside and out. [Okay.]

1BB file 11021807_10.mp3 dtd 2/18/2011

[Should applicants be required to demonstrate system failures and troubleshooting in the technology? Like the G1000.] System failures and troubleshooting? [How much of that you think they should do? Or how should they proceed?] I think there should be an understanding of system failures and troubleshooting. How much of that, you can only test that verbally. But, I'm trying to think what could happen or whatever. Typically when a display goes out, I actually had a failure of a multi-function display on an Avidyne unit. And omm, I was working around some weather, I lost radar, I lost NEXRAD, but omm, this unit would never reboot. I pulled circuit breakers and it would never reboot. It wasn't a big deal. But I don't know how much you can really do when you're in flight? So I mean, I , to answer, I don't know, omm, I'd have to think about that one some more. [Okay. That's good.]

1BB file 11021807_11.mp3 dtd 2/18/2011

[72 % expressed difficulty performing certain Practical Test tasks, like partial panel, with displays. Is there anything other than partial panel that you have a problem with trying to demonstrate in a Practical Test?] No, I, Ommm, I know recently, omm had an applicant that hadn't taken an instrument, hadn't taken an instrument with another examiner. Told me the examiner knew nothing about the G1000 and he didn't even know how to simulate a failure on the G1000. Ommm, One of the things I dealt with in the beginning when we started getting G1000 and Avidyne was people's relunctance to actually ommm, pull breakers on the things. They had this idea it was going to mess the unit up when it rebooted and that type of thing. So ommm, but that's, that's something I haven't had a problem as of late. But I think there are probably examiners out there that haven't been, that are not as knowledgeable, and they're giving test in these units, and that may even apply to inspectors. I'm not sure. But I know when we were first getting G1000, I was flying as a charter pilot, and I'd go take a 6 month check or whatever it was, and a lot of it was teaching the inspector how the unit worked. And omm, show them, probably that's a thing of the past. [Okay, I've heard that similar comment.]

1BB file 11021807_12.mp3 dtd 2/18/2011

[55% of examiners think the FAA should provide more advanced display training to examiners. What specific training elements might you like to see in some FAA training? If any?] I'm sorry. [From an examiner what would you like to see from the FAA in the way of training for examiners?] You know, we got a training session coming up right now with the FAA. An, annual, bi-annual training where we go to the, where we're required bi-annually to take an online course and then go to a 1 day course. It used to be 2 days, now they do part of it online, then part of it we go to a hotel pay to be trained. You know, you sit through this, some of the things the FAA does is so inept it's beyond belief to me sometimes. We go to this training and it's typically about paperwork. And I know paperwork is important and getting all these things down, as far as using IACRA and all those things. But, ommm, ommm, I would think they could use it as venue some of these trainings to, training sessions to get across certain points. What's the proper way to test an applicant with certain units and give handouts. And that could be used for future reference as what, minimum of what has to be done with certain units. So a person can go into a testing environment and be, be equipped to do what they're supposed to be doing. And omm, if the person, doesn't even to know how to use the unit, they're certainly not even, going to know how to test somebody properly to any kind of acceptable level. But omm, {okay, that's good. I've had similar comments there as well.]

1BB file 11021807_13.mp3 dtd 2/18/2011

[Just to wrap up I know you guys are trying to get to your destination. Is there any other comments or suggestions you might want to make about this topic?] I think that, ommm, the biggest thing that I can say about glass cockpits is that, I think that more research needs to be done, ammm, the experts that understand the human mind, on just how adaptable we are to some of these glass cockpits with digital displays? I think I related that to you earlier, that I think our minds are more adaptable to analog

indications (garbled). A needle in a relative position, and having both would certainly, having a display giving you a needle indication where you have relative position. I know I fly a King Air 350 with a Proline 21 on it, and the, awww, power setting indications, as far as torque, ah we have an analog along with a digital indication. And ommm, again with just digital indications (cough), it requires an assessment, requires, when I say time. Ommm analog indications I think are instantaneous. Whereas with a, when I say analog, I mean digitalized needle around a circle. You know what I'm saying, a relative position around a circle. [Haahaa.] (Garbled) With just a total digital number there, you have to assess that number. And ommm, I know when I go out and fly, like I go out and do a steep turn, say a glass cockpit, if I'm off 20 feet it's like a big big deal because I'm off. And you look at an altimeter, you're off, I'm within 50 feet, I'm, everything's fine. But ommm, because I'm constantly assessing that, well I'm really not off that much. You know, so the opposite can occur when you can be heads down or distracted and with a digital number, it doesn't give you instantaneous, ommm, information relative to whether it's acceptable or not. And I think more research needs to be done, ommm, with just how we, ommm take this information in our minds through our eyes and come up with a revolution, understanding, whether we're okay or not. I don't know if that makes any sense. But, ommm, does that make sense to you? [Absolutely.]

Interview #9

1CU file 11022409_01.mp3 dtd 24 FEB 2011

[The results from the questionnaire indicate that 64% of examiners were satisfied with current guidance and regulations for certifying airman in Advanced Display Technology equipped aircraft. What changes, if any, do you perceive still may be needed?] Just specifically in the glass cockpit type airplanes you mean? [Yeah just, primarily with the glass and the TAA type aircraft.] I think what I see is they just need more, there needs to be more emergency procedures training. On like if the MFD goes blank, what happens where the Primary Flight Display comes up? And things like that. The people who are flying them really don't have idea about that. [Any other part of the emergency procedures?] Mmmmmm, not, no. [Just primary loss of displays?] mmmmm, mmmmm. [Okay]

1CU file 11022409_02.mp3 dtd 24 FEB 2011

[Specifically with respect to pilot experience requirements, like flight hours, number of cross countries, or things like that. Do you perceive any changes may be need there as a result of the technology?] Ah, I don't think there are any changes that need to be made. Mainly people become totally dependent on it and they have no knowledge of how to do dead reckoning with a sectional map. If the display went out they're basically lost because they don't have the little magenta line to follow. [Got a question just on that. Omm, okay.]

1CU file 11022409_03.mp3 dtd 24 FEB 2011

[Result from the questionnaire indicate the 81% of examiners perceive conventional navigation skills have been degraded. You walked right into that one! As a result of the technology. How should training and continued training be changed to ensure proficiency with conventional navigation skills? What do you think could be done?] Well mostly, the people I'm checking they know ahead of time I'm going to fail the map displays. Hold on a minute. (cough) Excuse me. And that they're, they are going to be required to do dead reckoning navigation without any GPS assistance anyway. Which is kind of, you know required. Ommm, I think that the instructors in the field are just going to have to continue to do basic map navigation and kind of forget this fancy stuff until later on. [Okay.]

1CU file 11022409_04.mp3 dtd 24 FEB 2011

[Advanced Display Technology has the ability to alert and aid pilots in potentially serious situations. There's a lot of feature and gee wiz stuff out there. At the private pilot level, what features and capabilities do you think should be taught and tested?] Taught and tested maybe proper use of TCAS in response to TARAs in, on the system. What the pilot should do in the event of a TARA involving TCAS ommm alerts and so forth? They're not really taught anything they're just. When you get a traffic alert they just look at it – like oh there's an airplane over there somewhere. Ommm, other than that the procedures if they get an emergency involving terrain issue, you know. Ah, they get a TERRAIN TERRAIN, And what they should do? How to avoid it? And the procedure to go through. There's really not any

training or standardized training out there. There's none required in the PTS that I can remember that would. But maybe, they probably need more training in those things. [Good.]

1CU file 11022409_05.mp3 dtd 24 FEB 2011

[How might training and testing address issues like automation surprise? You know when the units catch them off guard, maybe not paying attention, and it starts beeping and hollering at them?] Mmmmmm, I'm not sure what you're asking. [Sometimes people get caught off guard, when the machine's flying the airplane, the all of a sudden something happens – audible alarms and so forth. And maybe they're not paying attention of where they are on the maps and so forth. You got any idea or experience with that with the students?] No, not really. [Okay]

1CU file 11022409_06.mp3 dtd 24 FEB 2011

[The results from the questionnaire indicate that 70% of examiners perceive that advanced display technology has created risk taking behavior environment, like flying in lower visibility or over reliance on the technology. How could training be modified to reduce this risk taking?] I hadn't noticed or experienced any of that. [Okay.]

1CU file 11022409_07.mp3 dtd 24 FEB 2011

[Results from the questionnaire indicate that 85% of examiners perceive that more emphasis should be placed on higher order pilot skills. That would be like single pilot resource management and so forth. What higher order pilot skills should be taught and tested at the private level do you think? If any at all.] I don't think any. Any other than, you know, nothing other than what's already being done. [Okay.]

1CU file 11022409_08.mp3 dtd 24 FEB 2011

[Should training and testing require applicant to understand how the system works? Pertaining to the G1000s and the Avidynes. If so, what depth of understanding should a private pilot know about these new systems?] Hold on a second. Mmmmmm. Well, like you know, I don't know. They should know how to use it I guess. Not many private pilots that I deal with are involved at all with the G1000, so that's more later on in life when they are doing their instrument rating and so forth. So if you're talking private pilot. [Okay, we're just seeing what you experienced.]

1CU file 11022409_09.mp3 dtd 24 FEB 2011

[According to the questionnaire, 93% of examiners require demonstration specific features or tasks associated with the Advanced Display Technology. What specific features or tasks to you require or think should be demonstrated during a Practical Test?] Ammm, I ask them to demonstrate how to load a route they may fly. Also to use the different functions of it, like the traffic display function, and a the timing function – where the timers on there, and the INSET function, and the transponder. That's about it for a pivate. Plus some of the emergency features. [Cool.]

1CU file 11022409_10.mp3 dtd 24 FEB 2011

[Should applicants be required to demonstrate system failures and troubleshooting procedures? And if so, what should be demonstrated? This would be associated with the technology displays.] Well (long pause) [A lot of people express there's a limit to what you can fail on these new systems.] Yeah, there is, you know they don't like us pulling circuit breakers. So we don't do that. [Some people kind of told me they do verbal what if scenarios.] I don't really do too much of that. So, I guess I don't have a good answer for you there. [Okay, that's fine.]

1CU file 11022409_11.mp3 dtd 24 FEB 2011

[Related to that, 72% of examiners expressed difficulty performing certain Practical Test procedures and tasks, like partial panel with the displays. Is there anything other than partial panels that gives you a problem with?] No I don't really have a problem with it. I use a, a cut-out plastic thing, kind of what you would put up on a window of your car to avoid sun coming in. You just kind of stick it up there. [mmm,mmm] So I just have a, have a couple of the instruments covered up with that. And place that over the flight display. Because you really can't turn it off you know. Now I think the Avidyne you can dim it down or something like that where they use the standby instruments. On the G1000, it seems to be more of a problem. [Yes, they've told me that before.]

1CU file 11022409_12.mp3 dtd 24 FEB 2011

[Switching to examiner needs, 55% of examiners responding to the questionnaire think the FAA should provide more Advanced Display Technology examiner training. What specific training elements, if you were going to have this training, what you might want to see?] I don't want to see anything. The least work I have to deal with the FAA is better for us. Besides no one at the FAA FISDO in (location removed) knows anything about it. They don't fly it. They don't know. They don't do it. Thus they can't help us if they don't use it and know anything about it. [I've had some people mention, they thought that some of the annual clinics so forth would be better if they had the ability to disseminate information about different topics including this. Would that be of any benefit to you?] That might be of benefit if you could find somebody that knew anything about it. The annual seminars are worthless anyway. So they're just a waste of time really. [That's a common response from the survey.]

1CU file 11022409_13.mp3 dtd 24 FEB 2011

[Is there anything just to wrap up, is there anything concerning this technology that I hadn't mentioned that might be a concern?] No, because you know, really during the private pilot check ride I pretty much keep them from using most of it anyway. I mean as far as navigational side of it, the map displays, so that I can ensure they are able to navigate with just a map and kind of do basic stuff like that. So, I can't think of anything else. [Actually that's very good.]

Interview # 10

1BI file 11022601_01.MP3 dtd 26 Feb 2011

[First question, results from the questionnaire indicate that 64% of examiners were satisfied with the current guidance and regulations for certifying new airman in Advanced Display Technology equipped aircraft. What changes, if any at all, do you perceive still be needed?] Mmmmm, I would probably go along with that. That overall regulations, ah, is a, I think difficult to get a good result by changing that, but I think some Practical Test Standard emphasis changes and ah some additional changes in training materials would help. [Ah, do you have any specific change areas in the PTSs that you would like to see?] Ommm, trying to think without have it in front of me here, I would just say emphasis on, continued emphasis on, or a little more emphasis on Aeronautical Decision Making and emphasis on Technically Advanced Aircraft both from a systems standpoint and putting them to use standpoint as it relates to cross country navigation and that kind of things. [Good. What about training materials, what would you, if you had your ideal case. What would you like to see in training materials?] Ommm, I think the FAA has done a pretty good job, ommm, at the instrument level with the Instrument Flying Handbook. Having a lot of glass panel stuff in it now, kind of splitting the book to both conventional analog gauges and glass panel. I think there is probably some room to do that with the Airplane Flying Handbook from a more of a VFR or private pilot training standpoint. A little more pictures and visual aids as they relate to glass panel Technically Advanced Aircraft. And ommm, maybe in addition to that, ommm, not so much in the Airplane Flying Handbook, but the other one which I'm drawing a blank. The Pilot Handbook of Aeronautical Knowledge, maybe a little more, (garbled) decent on that, a little more emphasis on Aeronautical Decision Making too. [Cool.]

1BI file 11022601_02.MP3 dtd 26 Feb 2011

[Specifically with respect to pilot experience requirements, that would be like number of flight hours, number of cross countries, or whatever, do you perceive any changes may be needed there as a result of the technology?] Ommm, I don't think there's a real clear demand at this point for changes. You know the fact that they have to pass the Practical Task Standards, the Practical Task Standards, omm you know allows for someone to learn in a more complex airplane that it's going to take longer and they can't perform to standards. So, I don't there's really a need to make a change there. But I think we'll probably continue to see the averages go up. Ommm, especially if more people learn to fly in Technically Advanced Aircraft. [I've had some people just say that absorbing all the information on the new glass, naturally takes longer. And they get it, in order to do that it just naturally takes a little longer on its own.] Yep, yep, I think that's a very valid statement.

1BI file 11022601_03.MP3 dtd 26 Feb 2011

[Results from the questionnaire indicate that 81% of examiners perceive that conventional navigation skills have been degraded as a result of the Advanced Display Technology. How could training and continued training address proficiency issues with conventional NAV skills?] Again, I would agree with that and the percentages pretty overwhelming there. I think it's just a continued emphasis ah, of course the examiner only has 1 day to work with it, but continued emphasis in training, continued emphasis on

conventional navigation skills. And then maybe even to the point of, ommmm, you know creating a simulated, you know, GPS failure, ommm and even having that scenario eligible, you know in the Practical Test Standard. Where they navigate somewhere with the GPS, simulate that it doesn't work anymore, and they have to find their way home or find their way to an airport without those modern NAVAIDs. [Cool.]

1BI file 11022601_04.MP3 dtd 26 Feb 2011

[Advanced Display Technology has the ability to alert and aid pilots in potentially serious situations. At the private pilot level, what features and capabilities of the technology should be taught and tested?] Ommm, that's a good point. Ommm I think maybe some emphasis on those features. Maybe even a Practical Test Standards guideline that, you can't tailor it to each individual one. But any of those features, you know, ah that will get you out of trouble. Make sure the applicant is familiar with those and certainly in training too often we get so hung up on conventional training and you need this many hours and you need to be able to do this. We forget this airplane has a feature that may save your life someday, so just an emphasis on making sure that both on training level and testing level that they're familiar with that. [Any particular features you think are more important than others?] I'm trying to think. I'm thinking very generally there. But, ommm, you know, ah, certainly autopilot and anything that automatic recovery features. Those kind of things. I think those are important. Those things that can really get you out of a bad situation, omm, in a hurry. I think those are important. [Okay.]

1BI file 11022601_05.MP3 dtd 26 Feb 2011

[How might training and testing address issues like automation surprise?] Ommm, there again with the more, more you can expose them to, the less surprises they have. You know when they get out in the real world or when a scenario is presented to them differently in a check ride. So again a more thorough, kind of back to before, there's so many features and it takes so long to absorb them. Ah, you know, just the acknowledging that it's going to take more time to expose them to all those things. But at the end, they're going to be much more qualified and safe to operate it. [Good.]

1BI file 11022601_06.MP3 dtd 26 Feb 2011

[The results from the questionnaire indicate that 70% of examiners perceive that Advanced Display Technology has created an environment of risk taking behavior, like flying in lower visibility. How could training be modified to reduce risk taking behavior?] You know ultimately in that respect because the airplanes do make you fell so comfortable, almost artificially so. The only thing I can think of that, that helps balance that is, omm, and certainly a case history of that, but review of accidents and incidents. And a real deep look at a pilot, ommm, with good intensions, but put themselves too deep into a dangerous situation and couldn't get out. Some sort of emphasis on accident review and to try to get the pilot to relate to the pilot in the accident. [Good.]

1BI file 11022601_07.MP3 dtd 26 Feb 2011

[Results from the questionnaire indicate that 85% of examiners perceive that more emphasis should be placed on teaching higher order pilot skills, and that would be like CRM and so forth. At the private pilot level, what should be taught and tested in respect to higher order pilot skills?] Ommm, I think that for one it goes back to, ommmm, something that has always been taught even though there wasn't as much emphasis is that, as, is you know the ability to change plans on the fly whether it be a 180 degree turn or whether it be a, ommm, a diversion to another airport. Ommm, but you know actually trying to actually work them through creates a scenario that demands that and watch them work through that on their own. Ommm, and do it with some realistic pressure and, ommm, outside pressures that makes them want to go the way they planned to go. [That's good. Thank you.]

1BI file 11022601_08.MP3 dtd 26 Feb 2011

[Should training and testing require applicants to understand how the systems work? I'm talking about the G1000 and Avidynes. If so, what depth of understanding should a private pilot be required to know?] You know I think in that respect the actually mechanical knowledge of how it works is because we're dealing with advanced electronics is less important than it is when you're dealing with something with moving parts. Ommm, so I think, you know a general knowledge of how it works combined with a thorough knowledge of all its features and what it can do for you is the best fit there. And I think when you go back to a conventional instrument, we spend a lot of time talking about its deficiencies, and common errors, and things you might see that are not accurate. But the new stuff is so accurate and has built in, you know, things to compensate for that. That it's not as important to know exactly how it works. How an accelerometer works for example. [That's good. It's a point that no one's brought up before. Thank you.]

1BI file 11022601_09.MP3 dtd 26 Feb 2011

[According to the questionnaire, 93% of examiners require demonstration of certain features or tasks associated with advanced displays. What features or tasks do you require or think should be demonstrated during a Practical Test?] Ommm, again you're focus, so I'm clear, is that the private pilot level or are we talking about instrument rating as well? [Primarily at the private pilot level, because they have the least amount of experience.] Yep, yep. I think in my own sense I'm probably guilty of requiring a lot less of the private pilots then I am from the instrument ones. Because on the instruments, obviously there's so much focus on the displays. So I really test them very thoroughly on that. At the private pilot level, ommm, you know I'd like to see an overall knowledge of how they can implement, how they can put everything in the airplane to use, ommm, to keep them safe. But I'm probably a little guilty of not practicing what I preach. And again because of the Practical Test Standards emphasis, I don't specifically talk about extra safety features, such as terrain warning, or weather information, or autopilot, or anything like that. I probably don't test it as much as when I'm in the instructor seat – I certainly put an emphasis on it. Ommm, getting through a check ride there's a certain amount of sticking through the Practical Test Standard that you do. I probably don't go as deep as what I would prefer to if the Practical Test Standards had an emphasis on it. [I've had several examiners pretty much say they just

want them to be able to turn the thing off, and fly the airplane safely back, and put it on the ground.] That's a good point too. Yeah, yeah, I fundamental skills that are necessary to operate, without it, are more important at that point.

1BI file 11022601_10.MP3 dtd 26 Feb 2011

[Should applicants be required to demonstrate system failures and troubleshooting with the displays?] Ommm, again there's only so much time, so I think it's much less important at the private pilot level then it is at the instrument pilot level and on up to the commercial level. So I would think that, personally I don't think it needs a tremendous amount of emphasis maybe a little but not much. [Okay.]

1BI file 11022601_11.MP3 dtd 26 Feb 2011

[72% of examiners expressed difficulty performing certain Practical Tests tasks and procedures, like partial panel, with the displays. Other than partial panel, is there any else you find difficult to perform?] No, I think that's the big one and there's getting to be more and more publications. The manufacturers have given us more and more information on how to, how to do that. But yes, partial panel is historically been the toughest one or the one that requires the most homework on the examiners part. Ommm, trying to think. That's really the big one though.

1BI file 11022601_12.MP3 dtd 26 Feb 2011

[Switching to examiners needs, 55% of examiners responding to the questionnaire think the FAA should provide Advanced Display examiner training. What specific training elements, if any, could improve the examiner's ability to perform these Practical Tests?] Ommm, I think, you know emphasis on, on those failure modes on those things we're required to see on the check ride. And I think equipment specific training. You know there are a few manufacturers out there and they are different. Garmin has multiple different displays now as retrofits and they're different as well. So I think ultimately the way that everybody's memory is, the best thing we could walk away with, is kind of a quick reference guide. I'm giving a check ride in an airplane with this equipment today, here's how the FAA recommends to do, failure modes, here's a quick overview of this product and what it can do. So some kind of a quick reference guide that could even be carried along on the check ride would be very valuable. [That's good.]

1BI file 11022601_13.MP3 dtd 26 Feb 2011

[Just to wrap up, do you have any other comments, recommendations, or concerns regarding this topic that I hadn't asked and maybe you have some thoughts on?] You know I think you hit'm all very well. And ommm, I drawing a blank in general as to anything that you didn't hit on. Ommm, I think, ommm, you know the accidents are proving we need to take a close look at what we can do to make these pilots better and help them manage the risk of operating these airplanes when they have such a high comfort level. So, ommm I think you hit on that quite well. So. [Good. I'm going to stop the recorder.]